Fertility preferences in the relationship context in Ghana

by

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DISSERTATION ABSTRACT

Background

Fertility preference is a commonly used term that refers to an individual's desire for more children. It is important at the aggregate level for projecting future fertility trends and evaluating family planning programs and policies. At the individual level, it is used for understanding childbearing and family planning use. Better understanding of fertility preferences—especially within the relationship context—can help gain further understanding of the measure and help individuals and couples better plan and space their children.

Methods

For this dissertation, I analyzed quantitative data from two datasets in Ghana. Using two rounds of data from the Family Health and Wealth Study (FHWS) for Aim 1, I assessed factors related to changes in fertility preferences, and focused on four relationship quality scales. Using data from women in couples in the 2008 Ghana Demographic and Health Survey (DHS) for Aim 2, I performed multinomial logistic regressions to understand how women's empowerment—as measured by their participation in household decision-making—was related to accurate perceptions of their partners' fertility preferences. I also tested to see if couple communication mediated the relationship between decision-making and preferences. For Aim 3, I used a modified Poisson regression to see if couple communication was related to being concordant with a partner on fertility preferences.

Results

Around 30% of women in the FHWS changed preferences between rounds. In the adjusted logistic regression model, none of the relationship quality scales were significantly

associated with the outcome. A few covariates were associated with a change in preferences over time, such as age and the birth of a child between data collection rounds.

Among coupled women in the DHS sample, 55.8% of women had accurate perceptions, 21.3% had inaccurate perceptions, and 22.9% had unknown perceptions of their partners fertility preferences. Women with no say in their husband's earnings were significantly more likely to have inaccurate perceptions. Couple communication—as measured by men's report of a discussion of family planning with a wife/partner—did not mediate this relationship in our sample. Women of Muslim faith were more likely to have unknown perceptions of their partner's preferences.

Approximately 25% of women were discordant on their partners' fertility preferences. Discussion of family planning, as reported by men, was not significantly associated with concordance, although both parity and polygamy were positively associated with discordance.

Conclusions

Fertility preferences are often used for policy-making, programs, and research. This dissertation examined preferences in the context of the relationship, especially related to the quality of that relationship and extent of couple communication. With a better understanding of individual and couples' preferences for more children (or not), we can better serve their reproductive needs and desires.

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CHAPTER ONE:

INTRODUCTION, BACKGROUND and DISSERTATION AIMS

Overview

The importance of fertility preferences

Fertility preferences, a commonly used measure that refers to an individual's desire for more children (DHS Program, 2015), are frequently used in reproductive and population research. Fertility preferences are important at the aggregate level for projecting future fertility trends and evaluating family planning programs and policies, as well as for understanding childbearing and use of family planning among individuals and couples. (Debpuur & Bawah, 2002; Morgan & Rackin, 2010; Santelli et al., 2003; Westoff & Ryder, 1977)

Globally, a substantial proportion of women report that they want no more children. In Sub-Sahara Africa, some countries report upwards of 50% of women of reproductive age wanting to either space or limit childbirth. (Van Lith, Yahner, & Bakamjian, 2013) Among sexually active individuals in their reproductive years, the logical result of a preference not to have more children is use of family planning. Yet, in many sub-Saharan African countries, contraceptive use is low, and 60% of pregnancies are unwanted. (Singh, Sedgh, & Hussain, 2010) With better understanding of the meaning of fertility preferences, we can help women and couples plan and space their children and meet their fertility and contraceptive needs.

Part I: The construct of fertility preferences

Scholars use desires, preferences and intentions interchangeably in research, yet each has their own distinct definitions. Although the literature often describes these terms interchangeably, I will refer to fertility preferences—defined as a desire (or not) for more children—throughout this dissertation. One reason is to be linguistically consistent. A

second reason is to adhere to what is most commonly seen in the fertility literature, especially in large-scale surveys like the DHS. (DHS Program, 2015) Finally, given the nature of the data available for this dissertation, preferences more accurately describe future fertility for individuals than do intentions in these analytic samples, as information related to the timing of desired fertility.

Researchers have assessed the validity and reliability of fertility preferences in a number of ways. This has included testing the stability of preferences over time (Bankole & Singh, 1998; Debpuur & Bawah, 2002; Sennott & Yeatman, 2012), understanding what factors are associated with preferences (Bankole & Westoff, 1998; Bongaarts, 2001; Dodoo & Seal, 1994; Kodzi, Casterline, & Aglobitse, 2010; Sennott & Yeatman, 2012; Toulemon & Testa, 2005; Upadhyay & Raine-Bennett, 2009), and examining how well preferences predict reproductive outcomes such as contraceptive use and childbearing. (Bankole & Singh, 1998; Bongaarts, 2001; Campbell & Campbell, 1997; Hossain, Phillips, & Mozumder, 2007; Kodzi, Casterline, et al., 2010)

The stability of fertility preferences over time

A long-standing theoretical debate in the fertility preferences literature is whether preferences change or are static over time. This is important because if preferences are inconsistent over time, meeting the contraceptive and fertility needs of individuals and couples will be challenged, and research that seeks to predict reproductive outcomes with preferences will likely be inaccurate. (Debpuur & Bawah, 2002; Dodoo, 1998) Some have argued that fertility preferences are fixed over time, accounting for achieved fertility (e.g. someone who has always wanted two children will want only one child once a child is

born). This has been shown to some extent in studies conducted in the United States. (Hayford, 2009; Schoen, Astone, Kim, Nathanson, & Fields, 1999; Westoff & Ryder, 1977)

Others, especially those conducting research in developing counties, have argued that fertility preferences vary over time and depend on many factors. (Agadjanian, 2005; Sennott & Yeatman, 2012) Studies in the developed world have shown that fertility preferences are not stable over time, especially among younger women with few or no children. (Klerman, 2000; Morgan & Rackin, 2010) In Africa, Sennot and Yeatman found variations over time in the construct in intervals as short as four months in their sample of Malawi women aged 15 to 25. (Sennott & Yeatman, 2012) Only a handful of other studies in the developing world have examined how and why fertility preferences change over time, especially at the individual level. (Bankole & Singh, 1998; Debpuur & Bawah, 2002; Gipson & Hindin, 2007)

Fertility preferences as an outcome

There have been copious scientific inquiries into the factors related to fertility preferences. It is not surprising that as life circumstances change, so do preferences. Socio-demographic characteristics such as age, wealth, relationship status, and education often significantly influence one's intended number and timing of children. (Kodzi, Casterline, et al., 2010; Toulemon & Testa, 2005) Individual preferences and experiences, such as previous pregnancy complications (Kodzi, Casterline, et al., 2010) or the death of a child impact fertility preferences (i.e. "replacement" effect, see (Bongaarts, 2001). Couple-level characteristics impact fertility preferences, like the preferences of one's spouse (Bankole & Westoff, 1998; Dodoo & Seal, 1994; Sennott & Yeatman, 2012) or the quality of one's relationship influence. (Upadhyay & Raine-Bennett, 2009; Wilson & Koo, 2008) Community

and societal factors, such as social norms like ideal family size (Voas, 2003) and access to mass media (Khatum, 2011; Westoff & Rodriguez, 1995), also influence individual fertility preferences.

Predictive ability of fertility preferences

At the population level, there is high correlation between fertility preferences and reproductive outcomes such as contraceptive use and childbearing. Multi-country studies in recent decades have demonstrated that decreases in the desire for more children are related to increases in contraceptive use and/or decreases in childbearing. (Bankole & Singh, 1998; Bongaarts, 2001) However, not all population-based research shows this correlation. Feyisetan and Casterline assessed changes in fertility and contraceptive preferences in sub-Saharan Africa between 1970s and 1990s, and concluded that most of the observed increase in contraceptive prevalence would have occurred despite changes in couples' fertility preferences —in other words, increases in contraceptive rates were attributed to satisfied demand. (Feyisetan, 2000)

At the individual-level, some research corroborates the population-level data. For example, Campbell and Campbell (1997) show in their Botswana sample that fertility preferences had a significant influence on future fertility. (Campbell & Campbell, 1997) More recently, Hossain et al. assessed husband's-level data to find that their preferences to limit childbearing predicted modern method use in Bangladesh. (Hossain et al., 2007) In Ghana, Kodzi's work demonstrated that, adjusting for important life events, fertility preferences were significantly related to contraceptive use. (Kodzi, Casterline, et al., 2010)

Yet some individual-level data show inconsistencies in people's preferences and subsequent reproductive behaviors. In developing countries, among women who reported they did not want more children in Morocco, Nigeria, and Bangladesh, 16%, 29%, and 17%, respectively, had a child in the years that followed. (Bankole, 1995; Bankole & Westoff, 1998; Gipson & Hindin, 2009) Speizer et al, based on their longitudinal work in India, concluded that more work should be conducted on fertility intentions, as they did not correlate with pregnancy/birth experiences in their sample of women. (Speizer, Calhoun, Hoke, & Sengupta, 2013)

What can explain the differences between aggregate and individual findings? It could be that individual men and women mistime their fertility but that these "errors" balance out at the aggregate level, which is what Morgan and Rackin (among others) suggested underscored their findings in a US sample that men and women had fewer children than intended. (Morgan & Rackin, 2010) Discrepancies between intentions/preferences and behaviors provide an opportunity to understand the constraints on meeting preferences (Morgan & Rackin, 2010) or to improve how we ask people about their preferences and interpret their responses. (Agadjanian, 2005; Bachrach & Morgan, 2012; Johnson-Hanks, 2007; Speizer et al., 2013)

Accurate perceptions of fertility preferences

Another way to understand the construct of fertility preferences is by assessing the extent to which one partner understands the other's preferences. Much of the literature on the accurate perceptions has focused on perceived attitudes about family planning. Men seem to perceive their wives' approval of family planning more accurately than wives perceive their husbands' approval. According to a review about couples and fertility in six

developing countries, Becker found that husbands were slightly more likely to know whether their wives approved of family planning than wives were to know of their husband's attitudes. (Becker, 1996) A number of studies have shown that women think their husbands are opposed to family planning use when they actually approve of it. (Ayaga A. Bawah, 2002; Kimuna & Adamchak, 2001; A. Lasee & Becker, 1997; Toure, 1996)

In a DHS analyses of 21 countries, the proportion of women who could correctly identify their partner's attitude toward family planning, specifically the spouse's disapproval of contraception, was higher among women who had discussed family planning with their husband than among those who had not. (DeRose, Dodoo, Ezeh, & Owuor, 2004) However, even when communication is high, inaccuracies exist. One Kenyan study found that although 85% of couples reported discussing family planning with their spouse in the past year, 34% of the wives whose husbands approved of family planning did not know this or thought that they disapproved. (A. A. Lasee, 1994)

Having accurate perceptions of a partner's preferences is important when it comes to outcomes like contraceptive use. In Kenya, wives' perception of their husbands' attitudes statistically correlated with contraceptive uptake (A. Lasee & Becker, 1997) more so than their own approval of contraception. (A. A. Lasee, 1994) In a more recent study, male and female Kenyans who perceived their partners to prefer fewer children than they did had nearly twice the odds of using modern contraception than those who had concordant fertility preferences or other discordant preferences. (Tumlinson et al., 2013)

Concordance on fertility preferences

Related to having accurate perceptions of a partner's preferences is the extent to which those preferences within the dyad align. Significant research has been conducted on concordance of fertility matters within a couple, including matching data between couples on ideal number of children, reported family planning methods, and fertility preferences. In a key review article on couples and reproductive health, Becker, who summarized studies from developing countries reporting on percent of spousal concordance, found a median level of 75% concordance among couples on an preference to have another child. On other fertility preferences measures, concordance ranged from 59 to 79% (Becker, 1996), a range which has been similarly seen in other data. (Bankole & Westoff, 1998; Takruri et al., 2013) According to Bankole and Singh, the proportion of couples in which each partners' ideal family size differs by two children or more ranges from 30% (in Bangladesh) to 72% (in Niger). In most couples, either both spouses wanted more or neither wanted more, but in 10-26% of countries, their desires differed. (Bankole & Singh, 1998) A recent couples' study among participants across five African sites found that concordance on fertility preferences for wanting more children ranged from 45% in Malawi to 70% in Nigeria. (Takruri et al., 2013)

Concordance on fertility-related matters like fertility preferences and reported contraceptive method is important, as it has been shown to be associated with contraceptive use. (Bankole & Singh, 1998; Bankole & Westoff, 1998; Harvey, Bird, Henderson, Beckman, & Huszti, 2004; W. Miller, Severy, & Pasta, 2004)

*

Fertility preferences are not formed in a vacuum; they are connected to numerous aspects of one's life, including feelings, attitudes, hope, desires, and fears. They are shaped by

spouses, family members, and peers, and are influenced by a system of structural and cultural mores. Similarly, though relationships have been of central concern in the reproductive health field, measurement and understanding of their nuanced elements is complex. Individuals think about relationships, sexuality, and fertility within their cultural environment, which means the same fertility preferences constructs in different contexts can result in a diversity of answers. (Santelli et al., 2003) Even the idea of a preference itself may not be applicable across all cultural settings. (Agadjanian, 2005; Johnson-Hanks, 2007; Santelli et al., 2003)

Part II: Fertility preferences in the relationship context

As most adults around the world are in a sexual relationship, fertility preferences are important to study for both the individual and the couple. Fertility within the dyad can be influenced at multiple levels, from the larger environmental context to individual personality characteristics. For example, social and cultural mores can dictate how men and women interact with each other, and gendered norms can give rise to inequitable inter-personal dynamics that impede the realization of women's own preferences and behaviors. Yet no matter the context, couples communicate in some form about their preferences and behaviors; fertility decisions are formed and acted upon to avoid or become pregnant.

Relationship quality

One aspect of a couples' relationship is its quality. Relationship quality is a broad construct with a number of dimensions including intimacy, honesty, satisfaction, commitment, trust, love, conflict, autonomy, communication and equality. Significant research, mostly in the developed world, has been generated over decades to further understand the underlying dimensions of "quality" and how these dimensions interact.

Relationship quality is associated with personal well-being (Pretorius, 1997; Proulx, Helms, & Buehler, 2007; D. G. Williams, 1988; K. Williams, 2003) and family health and child development (Greeff, 2000), including children's mental health. (Harrist & Ainslie, 1998; Jekielek, 1998; Jeong & Chun, 2010) In the fertility field, relationship quality has also been associated with contraception use, though the strength and direction varies depending on the specific aspect of quality being measured (e.g. sexual satisfaction or communication) as well as the contraceptive method examined (e.g. condom). (Bianchi-Demicheli et al., 2003; Cox, Hindin, Otupiri, & Larsen-Reindorf, 2013; Harvey et al., 2006; Manlove, Ryan, & Franzetta, 2007; Sayegh, Fortenberry, Shew, & Orr, 2006; Wilson & Koo, 2008) Recent research suggests that higher quality is associated with increased communication with a partner about family planning and fertility in general. (Izugbara, Ibisomi, Ezeh, & Mandara, 2010)

To date, the association between relationship quality and fertility preferences has not been explored. Only a handful of studies from the developed world have investigated relationship quality and fertility-related aspects, and the results are inconclusive. Some evidence supports the idea that couples in an unstable relationship are less likely to have a child, either due to reduced coital frequency (Cohen & Sweet, 1974; Thornton, 1978) or due to a fear that having a(nother) child might increase the risk of relationship dissolution. (Lillard & Waite, 1993) Other evidence supports the idea that couples with lower relationship quality have more children, and may also begin childbearing earlier. (Friedman, Hechter, & Kanazawa, 1994; Myers, 1997) Rijken and colleagues' research found that Dutch couples were more likely to have more children if they had neither too low nor too high relationship quality. Specifically, they found that couples with very low relationship quality—described

by the authors as having too many negative interactions—as well as couples that experienced many positive interactions, were more likely to delay childbearing. (Rijken & Liefbroer, 2009; Rijken & Thomson, 2011)

Couple communication

How members of a couple communicate their preferences to each other about current or future fertility is critical to whether pregnancy is planned, unplanned, wanted or unwanted. (W. Miller et al., 2004) If communication is successful, members of a couple discuss their individual preferences, and if they disagree, they may attempt to arrive at a mutually agreeable solution.

Couple communication (often referred to as "spousal communication") about family planning and fertility preferences has a long history. In various DHS reports from the 1990s, prevalence of spousal communication in the last year (as reported by women) about family planning ranged from 19% in Niger to 66% in Kenya. (Becker, 1996) One older study from Ghana found that 35% of women and 39% of men reported they had discussed family planning with a spouse. (Salway, 1994)A more recent study from Kenya found that 23% of women and 30% of men had never discussed family planning. (Tumlinson et al., 2013)A recent study from Ethiopia reported that 60% of men reported they had a discussion with their wives about family planning. (Adugnaw et al., 2011)

A number of demographic characteristics are associated with spousal communication, including education, wealth, residence, and religion. (Klomegah, 2006) Couple communication about family planning is associated with increased contraceptive use. (Ayaga A. Bawah, 2002; Becker, 1996; Beckman, 1983; Feyisetan, 2000; Hartmann, Gilles,

Shattuck, Kerner, & Guest, 2012; Irani, Speizer, & Fotso, 2014; Kimuna & Adamchak, 2001, 2001; Klomegah, 2006; A. Lasee & Becker, 1997; Link, 2011; Salway, 1994; Shattuck et al., 2011; Tumlinson et al., 2013; Yue, O'Donnell, & Sparks, 2010) Difficult spousal communication may be linked to covert contraceptive use. (Biddlecom & Fapohunda, 1998) Research indicates that disagreement on fertility preferences is more likely due to lack of communication than articulated opposition. (Greene & Biddlecom, 2000)

Women's participation in household decision-making

Gender dynamics are an important element of a relationship, especially in the African context where traditional gender roles and patriarchal structures within marriage are stronger as compared to the developed world. Understanding how empowered women are in their relationship to speak about their reproductive intentions and desires is important for couple communication about fertility-related matters.

To understand women's participation in decision-making in the relationship context, one must start with the women's empowerment literature. Women's empowerment has been officially on the research agenda since the 1994 International Conference on Population and Development, where focus was placed on the link between gender equality and women's empowerment as key for health outcomes. Empowering women not only impacts their own welfare, but the welfare of their families and the development of society. At a basic level, not supporting the empowerment of women can been seen as restricting a fundamental human right. (Kishor & Subaiya, 2008)

Empowerment spans multiple dimensions, including social, economic, familial, reproductive, legal, and psychological. (Malhotra, Schuler, & others, 2005) In addition, some

have argued that women's empowerment should be evaluated as a process and an impact, i.e. the sources, setting and then the evidence of empowerment. (Kishor & Subaiya, 2008) Due to the myriad of ways that women's empowerment can be measured, comparisons across studies and countries has been challenging. Since empowerment is such a nuanced concept, most researchers have attempted only to capture a few of the empowerment dimensions at a time, such as the perception of women's status in society. (Hindin, 2005)

Theoretically, having greater control over resources translates into greater autonomy over other aspects of life. Cross-sectional studies have found associations between women's empowerment—measured in a variety of different ways—and adoption of modern contraception. (Do & Kurimoto, 2012; Hogan, Berhanu, & Hailemariam, 1999; Schuler & Hashemi, 1994; Woldemicael, 2009) However, not all expected associations between women's empowerment and fertility-related outcomes like preferences and contraceptive use have expected results. (Hindin, 2000; Upadhyay & Karasek, 2012)

The DHS captures a number of empowerment aspects in its national surveys. One such set of questions focuses on women's participation in household decision-making, which represents a woman's degree of control over economic decisions in the household and qualify as evidence of empowerment. (Kishor & Subaiya, 2008) These questions inquire about who makes the final decision about household purchases (large and daily), visits to family, the woman's own health care, and how the husband's earnings are spent. Women can report that they made these decisions alone, jointly, or that they had no say.

The interpretation of these questions and answers depends on both cultural context and research questions. In some cases, whether a woman makes final decisions alone is seen as

the best proxy for empowerment. Empowerment measured this way has been tested for its association with women's under-nutrition (Hindin, 2005, 2006) and children's health (Desai & Johnson, 2005), though results were mixed and inconclusive across multiple settings. It is unknown if this is due to a lack of relationship between empowerment, and the outcomes of interest, or whether this measurement of empowerment is insufficient. Although it would be expected that more decision-making power and equitable gender role attitudes would be associated with lower fertility preferences, Upadhyay et al. found inconsistent results in Sub-Saharan Africa on the relationship between women's empowerment and a desire for fewer children. (Upadhyay & Karasek, 2012)

Others have suggested that joint decision-making better reflects empowerment; in this view, women are empowered when they are able to make decisions on an equal footing with their partners. In fact, one study in Nepal showed that where husbands and wives made decisions jointly, the husband was more likely to be involved in pregnancy health. (Mullany, Hindin, & Becker, 2005)

Due to the complexity of knowing what deciding alone or jointly means, most researchers have focused on understanding women who do not have a say in these decisions at all. Among couples where men made the final decisions and women had no say, women were less likely to approve of family planning, use a modern method, discuss fertility preferences with their spouse, and were more likely to have children. (Do & Kurimoto, 2012; Hindin, 2000; Mistry, Galal, & Lu, 2009; OlaOlorun & Hindin, 2014) Conversely, women who have a say in household decision-making are more likely to adopt modern contraception, although it should be noted these are cross-sectional studies so causality cannot be inferred. (Do &

Kurimoto, 2012; Hogan et al., 1999; OlaOlorun & Hindin, 2014; Schuler & Hashemi, 1994; Woldemicael, 2009)

Part III: Study context

The data for this dissertation come from Ghana, specifically from two different data sources collected between 2007 and 2011. One dataset—the Family Health and Wealth Study (FHWS)—is from peri-urban communities in the services and manufacturing city of Kumasi. The other data source is the Ghana Demographic and Health Study (GDHS), which is nationally representative. In many ways, Ghana is an ideal setting for this dissertation. In the last 25 years, despite a declining total fertility rate and falling ideal family size, contraceptive use has stagnated and unmet need is high. (GSS & Macro, 2009) There is articulated desire for spacing and limiting pregnancies, yet unplanned pregnancies are common. Understanding how fertility preferences are connected to relationship characteristics may shed light on this reproductive health situation in Ghana.

The Republic of Ghana, a country in West Africa on the Gulf of Guinea, was the first sub-Saharan country to gain independence from the British in 1957. Though it is surrounded by French-speaking Togo, Cote d'Ivoire and Burkina Faso, the official language is English. There are ten administrative regions of Ghana and 170 districts. The capital of Ghana is Accra, which is a port city on the southern coast. Kumasi, in the Ahsanti region, is the second largest city in Ghana. (GSS & Macro, 2009)

According to the 2010 census, the largest ethnic group is Akan (47.5%) followed by Mole-Daghon (16.6%) and the Ewe (13.9%). Christianity is the most commonly practiced religion (71.2%), followed by Islam (17.6%) and other traditional religions (5.2%). (Ghana

Statistical Service, 2012) Ghana is one of the more developed countries in the region; according to the UNDP it has become a "medium human development" country ranked, 138 out of 187 countries in 2013. (UNDP, n.d.)

Demographic and reproductive context

The country's first census in 1960 reported a total population of 6.7 million (GSS & Macro, 2009, p. 200) By 2010, this population had increased to nearly 24.7 million.(Ghana Statistical Service, 2012) In mid-2014, the population was estimated to be 27 million. (PRB, n.d.)

Major trends in fertility, fertility preferences, and contraceptive use are presented in **Table 1.1,** which shows data from the past five DHS survey rounds. The total fertility rate (TFR) dramatically declined in Ghana in the 1980s and 1990s, from 6.4 children (per woman) in 1988 to 4.4 children/women in 1998. Since that time, the TFR has been relatively stable, declining to 4.0 children/women during the last DHS survey in 2008. Unplanned pregnancies in Ghana also dramatically decreased for several decades; however, they are still common. In 2008, 14% of births were unwanted while 23% were mistimed. **Table 1.1** also shows more recent data from PMA2020 from Ghana, which is a nationally representative data collection system that conducts surveys of key family planning indicators in support of FP2020 goals. In recent years, the TFR has decreased from 3.7 in 2013 to 3.5 in 2014. Unplanned pregnancies appear to be slightly higher in this sample than the DHS sample, around 41% in 2014. ("Performance, Monitoring and Accountability 2020," 2015)

Table 1.1: Trends in reproductive health indicators in Ghana, 1988-2014

DHS data						PMA2020 data	
Indicators	**1988**	**1993**	**1998**	**2003**	**2008**	**2013**	**2014**
Fertility							
Total Fertility Rate (avg. # of children /woman)	6.4	5.2	4.4	4.4	4	3.7	3.5
Unplanned pregnancies (% of all births)	n/a	42.4	36.4	39.8	37.3	42.9% (Recent births unintended)	41.2% (Recent births unintended)
Fertility preferences							
Ideal family size (# of children)	5.5	4.4	4.3	4.8	4.6	n/a	n/a
Desire to space births (%)	44.9	39.3	34.6	37.5	35.7	24.4 % (unmet need for spacing)	22.2% (unmet need for spacing)
Desire to limit births (%)	22.1	33	33.5	34.1	34.8	12.8 % (unmet need for limiting)	10.4% (unmet need for limiting)
Contraceptive use							
Contraceptive prevalence rate (%)	12.9	20.3	22	25.2	23.5	19.5	25.7
Use of modern contraception (%)	4.2	10.1	13.3	18.7	16.6	18.4	21.4
Unmet need (revised) (%)	-	36.9	34.7	34.5	35.7	37.2	32.7

Source: Ghana Statistical Service, 2009, 2004, 1999, 1994, and 1989.
PMA2020 2014/Ghana - R3
Note: these data are among women ages 15-49 who are married or in a union

Ideal family size has decreased over time, from a mean of 5.5 children in 1988 to 4.6 children in 2008. (GSS & Macro, 2009) In terms of fertility preferences, among currently married women, 36% would like to wait two or more years before their next birth, and the same percentage do not want another child. The desire to space births has declined from 45% to 36% over the last five DHS reports, and the desire to limit increased from 23% to 35% between 1988 and 2008. PMA2020 data show that unmet need for spacing has

decreased between 2013 and 2014 from 24.4% to 22.2% of married women, and the unmet need for limiting has decreased from 12.8% to 10.4% during that same time period. ("Performance, Monitoring and Accountability 2020," 2015)

Lastly, though awareness of contraceptive methods is nearly universal and use of modern contraceptive use has significantly increased since 1988, the percentage of currently married women reporting current modern contraceptive use declined from 18.7% in 2003 to 16.6% in 2008. (GSS & Macro, 2009) The most recent PMA2020 data report a slightly higher percentage of married women using modern contraception (21.4% in 2014). Total unmet need for family planning was 35.7% of women in 2008 DHS, and 32.7% of women in the 2014 PMA2020 data. ("Performance, Monitoring and Accountability 2020," 2015)

According to the most recent DHS in 2008, the most commonly used modern method was the injectable, at 6%, followed by the pill at 5%. The reasons given by currently married women for not using contraception were method-related (41.2%), fertility-related (31.0%), opposition from self, partner, others or religion (22.5%), and a lack of knowledge (3.5%). (GSS & Macro, 2009) (not shown in table)

The social and gender context in Ghana

Reproductive health and fertility in Ghana are strongly influenced by social norms related to family customs and religion, as well as gender norms and roles. Traditional Ghanaian conceptions of family encompassed not only spouses and children, but also the extended family of uncles, aunts, and cousins. Family elders arranged marriages, and the groom's family paid bride price. Most ethnic groups were patrilineal, and law and custom allowed for polygamy. Men and women sought prestige through high fertility and maintained

lineage, and a man could ask for a refund of bride wealth for a wife that failed to produce a child. (Lorimer, 1954) In most traditional Ghanaian societies, a woman was subordinate to the men in her life. (Manuh, 1984)

Nowadays, marriage dissolution has been estimated to be at a quarter of the ever-married women population. (Takyi & Gyimah, 2007) Trends in recent decades show a shift from traditional, arranged marriages toward ones in which men and women choose their own spouses. (Takyi, Miller, Kitson, & Oheneba-Sakyi, 2003)

The most recent GDHS contains indicators of current sociocultural aspects of modern Ghanaian life, such as women's role in modern society. Nearly 67% of household heads are men. (GSS & Macro, 2009) Though trends are changing toward increased autonomy for women, there still remains a high percentage of married women in Ghana who reported that their husbands make the final decision in each of the following four domains: the woman's own health care (30.3%), large household purchases (36.6%), purchases for daily needs (19.3%), and visiting family or other relatives (15.7%). (GSS & Macro, 2009) Nearly four in ten women think a husband is justified in beating his wife in at least one of five scenarios (e.g. the wife neglecting the children or refusing to have sex with her husband). (GSS & Macro, 2009)

In Ghana today, traditional influences continue to challenge women's ability to make their own reproductive health choices. Traditional gender scripts—especially men's disapproval of family planning and women's lack of autonomy—influence reproductive health such as contraceptive use. (Ayaga Agula Bawah, Akweongo, Simmons, & Phillips, 1999; Biddlecom & Fapohunda, 1998, p. 98, 1998; DeRose, Dodoo, & Patil, 2002; Do & Kurimoto, 2012; GSS &

Macro, 2009; Sossou, 2006) For example, historically, in Northern Ghana, men believed women should have little power when it comes to contraceptive decision-making. In a society where men strongly desire sex and children, women are inclined to use contraception to cease continuous childbearing. When family planning programs were rolled out in Kassena-Nankana communities in the mid-1990s, men grew "anxious" at the idea of their wives using contraception. Women who were using family planning were seen as failing to meet their childbearing duty, and some men saw them as adulterous. (Ayaga Agula Bawah et al., 1999)

Religion, ethnicity and culture have also been associated with a woman's ability to reach her fertility and reproductive health goals. Women from polygamous and patrilineal societies have less ability to reach their reproductive health goals than women in matrilineal ones (Takyi & Nii-Amoo Dodoo, 2005), and have lower use and approval rates of contraception. (Agadjanian & Ezeh, 2000) One 2006 study using DHS data found that Muslim and traditional women were less likely to use maternal and child health services than Christians. (Gyimah, Takyi, & Addai, 2006) While Addai found some indication that ethnic group is a barrier to contraceptive use among the Fante/other Akans, they concluded that overall, ethnicity was not an important factor related to contraceptive use, but rather access. (Addai, 1999)

Contraceptive use is linked to women's empowerment in Ghana. Using 2008 DHS data, Do and Kurimoto found that use of female methods was related to women's participation in household decision-making (RRR=1.14; $p<0.05$). (Do & Kurimoto, 2012) In another analysis, current use of contraception increased from 19% among women who do not participate in any of the household decisions to 24% among women who participate in at

least one. Women who believe that wife beating is justified in all five scenarios (previously described) are the least likely to use contraception. (GSS & Macro, 2009)

Fertility preferences context in Ghana

Social and gender aspects influence fertility preferences and the couple in Ghana. This next section will detail the fertility preferences literature from the country, followed by a summary of the evidence on relationship quality and couple communication, specifically perceptions of and concordance in fertility-related matters among couples.

In general, the trend in Ghana supports the idea that individuals' fertility preferences are relatively stable over time. In the mid 1990s, Debpuur and Bawah found that reported ideal family size was highly unstable over a two-year period, but responses about how many additional children remained stable. (Debpuur & Bawah, 2002) A decade later, in two related analyses among rural women in Ghana, Kodzi et al corroborated Debpuur and Bawah's results. Specifically, the authors found stability over a five-year period in measures of fertility preferences—only one in five women changed their preference—leading them to conclude that preferences are stable, and can predict and explain future fertility outcomes. (Kodzi, Casterline, et al., 2010; Kodzi, Johnson, & Casterline, 2010)

Gender dynamics appear to play a substantial role in fertility preferences. In one qualitative study, Ghanaian men and women suggest that men are dominant in influencing women's fertility preferences and decisions, such that regardless of a their high or low fertility preferences, women will almost always capitulate to a partner's preferences. (DeRose et al., 2002) In cases where men do not want a pregnancy, men may suggest or even demand an abortion, or deny responsibility for an unwanted child. (Schwandt et al., 2013)

The couple context in Ghana

Relationship quality

Strong gender dynamics influence relationship quality in Ghana. One qualitative study from Cape Coast found that a number of aspects were associated with poorer relationship quality, including certain spousal attributes, family life factors, sociocultural characteristics and structural inequality factors. The authors reported that psychological abuse was commonplace and utilized by both spouses, and they concluded that societal gender norms influence martial conflict and spousal behavior. (Abane, 2003) In an earlier study from the Upper East Region of Ghana, husbands' decision-making had a negative impact on marital quality; traditional gender norms and attitudes, along with wife's employment status, also indirectly impacted martial quality by influencing communication and decision-making. Husbands with less patriarchal attitudes and behavior reported higher quality in their relationship. (N. B. Miller & Kannae, 1999) Kinship ties, which are stronger than marital ties in Ghana, also impact relationship quality: matrilineal and autonomous women are more likely to get divorced compared to nonmatrilineal women, or women with lower autonomy. (Takyi & Broughton, 2006; Takyi & Gyimah, 2007)

A recent study by Cox el al. examined relationship quality using the four previously mentioned scales among married and cohabitating Kumasi couples to understand how different dimensions of quality influence contraceptive use. The authors found a stronger relationship between relationship quality and awareness methods (i.e. methods in which both partners know about the method, including periodic abstinence, withdrawal and condoms) than relationship quality and other methods. In some cases, men's self-evaluation

of quality appeared to have more influence on contraceptive use than women's evaluation of quality. (Cox et al., 2013)

Couple communication

Couples' communication on reproductive and fertility matters has been repeatedly shown to influence subsequent contraceptive uptake in Ghana. (Avogo & Agadjanian, 2008; Ayaga A. Bawah, 2002; Salway, 1994; Tawiah, 1997) However, spousal communication on family planning has been reportedly low in Ghana, with the percentage of women reporting never speaking to their husbands about family planning ranging from 57.9% in 1988 to 41.3% in 2003. (Ghana Statistical Service, 2004) This question does not appear to be asked in the 2008 DHS survey. (GSS & Macro, 2009)

When it comes to being concordant with or having accurate perceptions of a partner's reproductive and fertility preferences, most of the research comes from the 1988 GDHS. Only 44% of couples were concordant on ideal family size (Salway, 1994), and only 17% of couples asked retrospectively about fertility preferences were concordant; more often than not, men want more children than women. (Dodoo & Seal, 1994) Concordance in reporting of fertility-related measures was 79% for having more children and 75% for approving of family planning. (Ezeh, 1993) This followed from a study using Ghana DHS data that showed 76% concordance between wives and husbands on a desire for more children. (Salway, 1994)Discordance in contraceptive attitudes and decision-making, as well as perceptions of ideal family size, is higher in polygamous areas. (Agadjanian & Ezeh, 2000) In a more recent study, husband-wife concordance on reports of contraceptive use was extremely low, at 12%. (Takruri et al., 2013)

In terms of accurate perceptions, according to an older report, 61% of wives correctly identified their husband's attitudes about family planning. (Salway, 1994)

Little research exists on how concordance and accurate perceptions are related to other behaviors, though discussing family planning has been associated with increased concordance in Ghana. (Becker, Hossain, & Thomson, 2006; Ezeh & Mboup, 1997)

Part IV: Dissertation aims, hypothesis, and conceptual frameworks

Three components of fertility preferences are explored in this thesis. First, the construct of fertility preferences will be measured and conceptualized in three ways as follows: 1) how a woman's preferences change over time, 2) how accurate her perceptions of her partner's fertility preferences are, and 3) whether she has concordant preferences with her partner. Understanding preferences from three distinct perspectives will contribute to a more in-depth understanding of this critical construct. Second, this dissertation will explore one of the most important contextual aspects related to fertility—the relationship—to understand how relationship characteristics may influence fertility preferences.

The specific aims of this dissertation are as follows:

Aim 1: Examine the extent to which fertility preferences change between two points in time, and how relationship quality is associated with any observed changes in fertility preferences over time among women in the FHWS.

> Hypothesis: Women who score lower on relationship quality scales at baseline will have less stable fertility preferences at follow-up, compared to those with higher relationship quality scores.

Aim 2: Examine how women's participation in decision-making is associated with accurate perceptions of their partners' fertility preferences among women in the GDHS.

> Hypothesis 1: Women with low participation (i.e., have no say) in household decision-making are more likely to have inaccurate or unknown perceptions of a

partner's fertility preferences, compared to women with at least some participation in decision-making.

Hypothesis 2: The association between decision-making and accurate perceptions is mediated by couple communication.

Aim 3: Examine how couple communication about family planning is associated with woman's concordance with a partner on fertility preferences among women in the GDHS.

Hypothesis 1: Couples that communicate about family planning are less likely to be discordant on fertility preferences, compared to couples that do communicate.

The conceptual frameworks for Aim 1 through 3 are in **Figure A1.1 through Figure A1.3** in the appendix of this chapter.

Figure A1.1 shows how the constructs of interest are related for Aim 1. Specifically, it shows how all the background characteristics at the household, dyad and individual levels directly and indirectly impact the dependent variable, a change in fertility preferences. These background characteristics also influence the independent variable, relationship quality, and themselves are influenced by community-level factors. Community-level factors include gender or other social norms, for example about how many children couples should have and how men and women should interact in marriage. With the exception of the community-level factors, this figure shows the background characteristics that are measured in this dissertation.

Figure A1.2 shows how the related constructs are related for Aim 2. Specifically, it shows how all the background characteristics at the household, dyad and individual levels impact women's empowerment (i.e. their participation in five domains of household decision-making), which impact women's accuracy of their partner's fertility preferences. The relationship between women's empowerment and accuracy may be mediated by whether

the couple has had a recent discussion about family planning, as has been depicted in the conceptual framework and as will be tested in the analysis.

Figure A1.3 shows the constructs of interest for Aim 3. Specifically, it shows how all the background characteristics at the household, dyad and individual levels directly and indirectly impact the dependent variable, concordance with a partner on fertility preferences. These background characteristics also influence the independent variable, discussion of family planning, and themselves are influenced by community-level factors. With the exception of the community-level factors, this figure shows the background characteristics that are measured in this dissertation.

Organization of the dissertation

Chapter two contains the first of three manuscripts and is titled: "Relationship quality and changes in fertility preferences over time among women living in Kumasi, Ghana." This chapter shows the results of Aim 1, focusing on the stability of fertility preference over time and the association between that change and relationship quality.

Chapters three contains the second of three manuscripts and is titled: "Women's participation in household decision-making and their perceptions of their partners' fertility preference in Ghana." This chapter presents the results of Aims 2, focusing on the relationship between women's participation in decision-making and accurate perceptions of a partner's fertility preferences.

Chapters four contains the last of three manuscripts and is titled: "Couple communication and concordance with partners' fertility preferences in Ghana." This chapter presents the

results of Aims 3, focusing on the relationship between couple communication and concordance in fertility preferences.

Chapter five presents the cross-cutting conclusions from all three analyses, as well as the limitations and strengths of the dissertation, the public health implications, and a brief conclusion.

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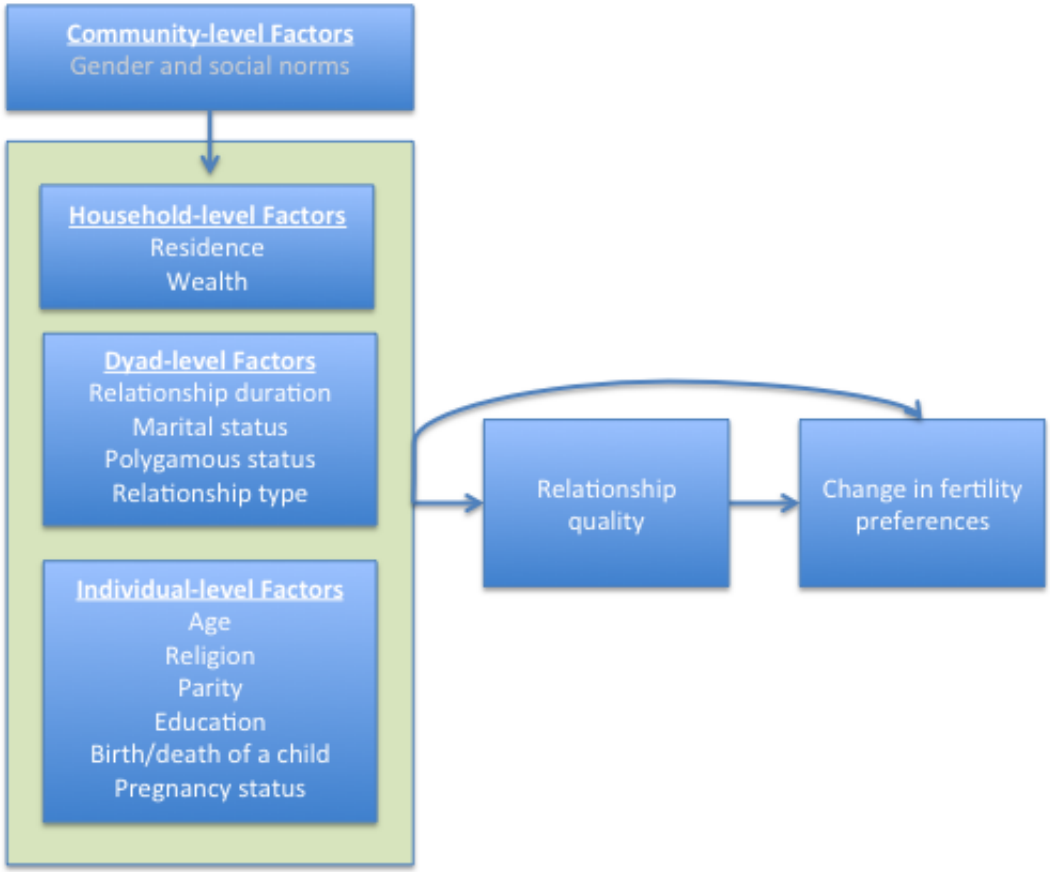
Appendix: Conceptual frameworks

Figure A1.1: Conceptual Framework of relationship quality and a change in fertility preferences over time (Aim 1)



Bolded constructs are the analytic constructs of interest
Italicized constructs are theoretical constructs not measured as part of this dissertation

Figure A1.2: Conceptual Framework of women's participation in household decision-making and perceptions of a partner's fertility preferences (Aim 2)

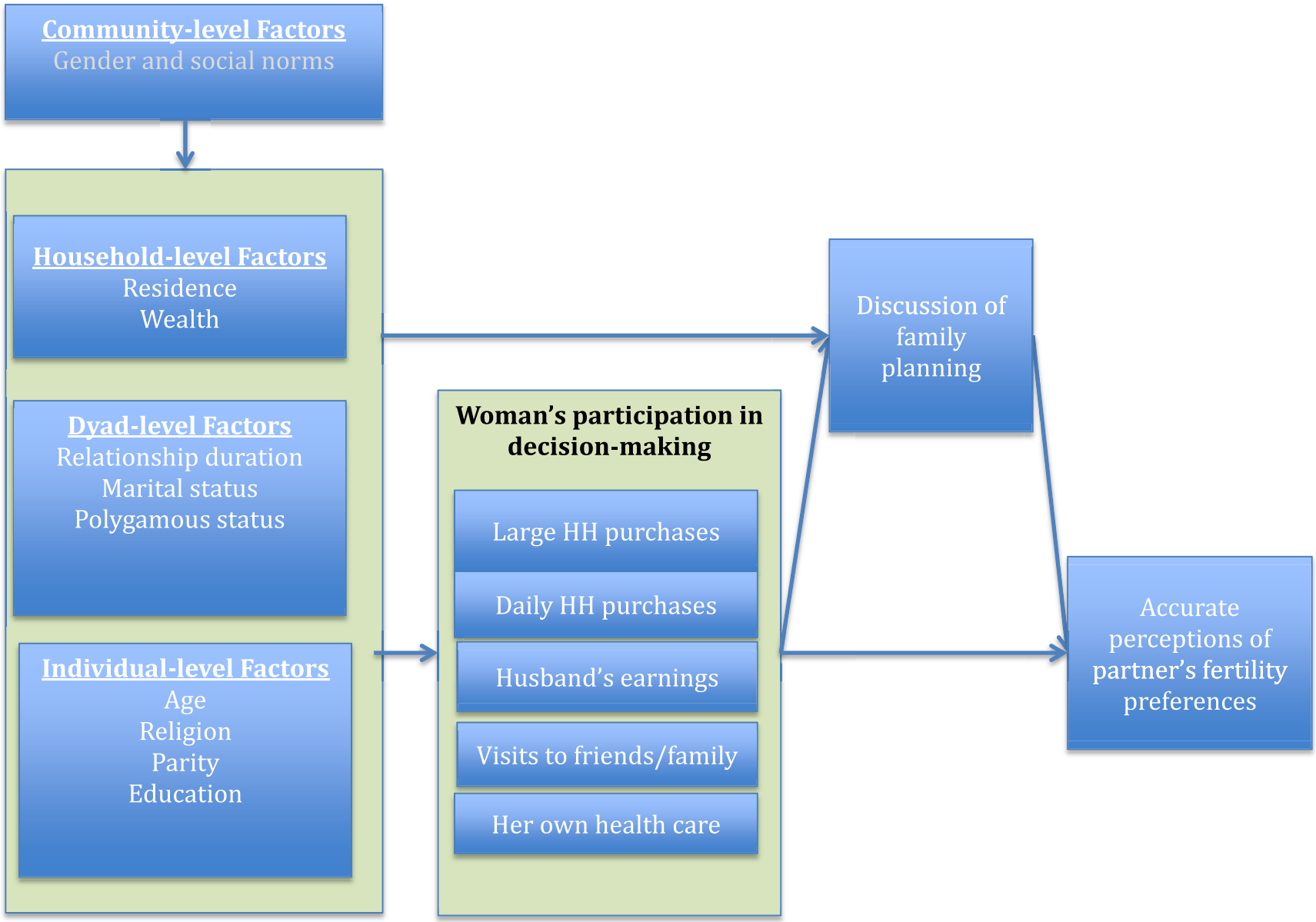
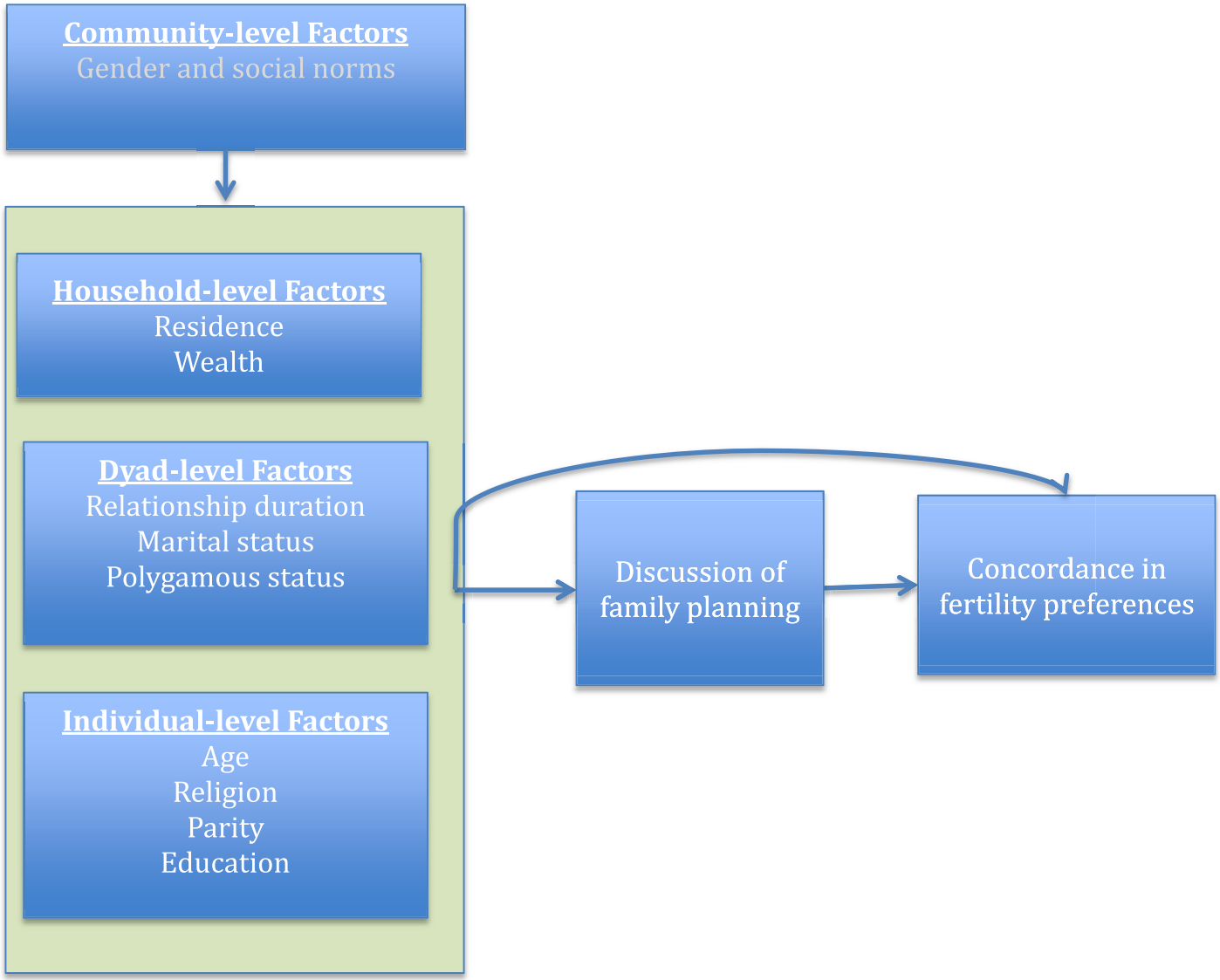


Figure A1.3: Conceptual Framework of couple communication and concordance with a partner on fertility preferences (Aim 3)



CHAPTER TWO:

MANUSCRIPT ONE

Relationship quality and changes in fertility preferences over time among women living in Kumasi, Ghana

Introduction

Fertility preferences, or the desire for more children (DHS Program, 2015), may change or may be static over time. Most studies from African countries show that fertility preferences are somewhat unstable over time, especially among younger women with few or no children. (Debpuur & Bawah, 2002; Kodzi, Casterline, & Aglobitse, 2010; Machiyama et al., 2015; Sennott & Yeatman, 2012; Yeatman, Sennott, & Culpepper, 2013)

That preferences are not stable in the African context may be related to the measure itself. Johnson-Hanks' analysis of 18 African countries using DHS data found no correlation between self-report of fertility preferences and the reproductive patterns such as births, a link that classic fertility scholars have averred. Johnson-Hanks concludes that the "cultural repertoires" on which preferences are based and organized are different for African women than for women in Western cultures on which DHS questionnaires have been based. (Johnson-Hanks, 2007) Other researchers assessing preferences in Africa using both qualitative and quantitative approaches have made similar observations with respect to the limitations or cultural context of pregnancy and preferences. (Agadjanian, 2005; Machiyama et al., 2015; Speizer, 2006)

Life events associated with a change in fertility preferences include fertility-related events (i.e., birth or death of a child), a change in relationship status (i.e., marriage dissolution), and economic and health circumstances. (Bankole & Westoff, 1998; Kodzi, Casterline, et al., 2010; Sennott & Yeatman, 2012; Yeatman et al., 2013) A change in fertility preferences can also depend on what aspect of preferences is of interest, e.g. desired family size versus desire for additional children, as seen in (Debpuur & Bawah,

2002), or which partner's preferences matters more. (Bankole & Westoff, 1998; Dodoo, 1998; Gipson & Hindin, 2009) Fertility preferences are more likely to be unstable in areas where fertility is high and social norms around childbearing are in flux, such is the case in Sub-Saharan Africa. (Sennott & Yeatman, 2012)

If preferences shift over time, so too will women's need to plan and space their children. With better understanding of how fertility preferences change over time for individuals and couples, and what factors might be associated with that change, we can provide services that better meet contraceptive and fertility needs of men and women.

Background

Fertility preferences in the relationship context

Fertility preferences are frequently examined within the context of a relationship dyad. (W. Miller, Severy, & Pasta, 2004) What has been missing from much of the previous work on fertility preferences is a better understanding of couple characteristics. While a number of studies have investigated couple dynamics with respect to decreased household decision-making (Do & Kurimoto, 2012; Hindin & Muntifering, 2011; Woldemicael, 2009) and a lack of or infrequent communication with a partner about family planning (Ayaga A. Bawah, 2002; Izugbara, Ibisomi, Ezeh, & Mandara, 2010; Klomegah, 2006; Salway, 1994; Woldemicael, 2009), limited evidence exists on how couples' relationship quality impacts reproductive preferences and outcomes.

Relationship quality is a broad construct with multiple dimensions including intimacy, honesty, satisfaction, commitment, trust, love, conflict, autonomy, communication and equality. Relationship quality research has mainly been conducted in the developed

world, and this research has shown that relationship quality is associated with many aspects of health such as personal well-being (Pretorius, 1997; Proulx, Helms, & Buehler, 2007; D. G. Williams, 1988; K. Williams, 2003) and family health and child development (Greeff, 2000), including children's mental health. (Harrist & Ainslie, 1998; Jekielek, 1998; Jeong & Chun, 2010)

In terms of sexual and reproductive health, a number of studies from both low and high income settings have found that relationship quality is associated with contraception use, although the strength and direction varies depending on the specific aspect of quality being measured (e.g. sexual satisfaction or communication) as well as the contraceptive method examined (e.g. condom or pill). (Bianchi-Demicheli et al., 2003; Cox, Hindin, Otupiri, & Larsen-Reindorf, 2013; Harvey et al., 2006; Manlove, Ryan, & Franzetta, 2007; Sayegh, Fortenberry, Shew, & Orr, 2006; Wilson & Koo, 2008) One study from Nigeria found that as relationship quality increases, so does communication with a partner about family planning and fertility in general. (Izugbara et al., 2010)

To date, the association between relationship quality and fertility preferences has not been explored. Only a handful of studies from the developed world have investigated relationship quality and fertility, and the results are inconclusive. Some evidence supports the idea that couples in an unstable relationship are less likely to have a child, either due to reduced coital frequency (Cohen & Sweet, 1974; Thornton, 1978) or due to a fear that having a(nother) child might increase the risk of relationship dissolution. (Lillard & Waite, 1993) Other evidence supports the idea that couples with lower relationship quality have more children, and may also begin childbearing earlier. (Friedman, Hechter, & Kanazawa, 1994; Myers, 1997) Rijken and colleagues' research

found that Dutch couples were more likely to have more children if they had neither too low nor too high relationship quality. Specifically, they found that couples with very low relationship quality—described by the authors as having too many "negative interactions"—as well as couples that experienced many "positive interactions," were more likely to delay childbearing. (Rijken & Liefbroer, 2009; Rijken & Thomson, 2011)

Measurement of relationship quality

There are a number of scales used in research to operationalize and measure relationship quality. The five mentioned below are frequently used, and have established validity and reliability in developed countries.

Dyadic Trust Scale: The Dyadic Trust Scale was developed and validated in 1980 by Larzelere and Huston. It is eight-item scale that measures interpersonal trust in intimate relationships, with a focus on benevolence and honesty. (Larzelere & Huston, 1980) In a sample of individuals in dyadic relationships, Larzelere and Huston found high item-total correlation (all were greater than 0.70) and a high Cronbach's alpha coefficient of 0.93 for this subscale. (Larzelere & Huston, 1980)

Commitment Subscale: According to Sternberg's Triangular Theory of Love, there are three components to relationship love: intimacy, passion, and commitment. (Sternberg, 1986) Each of these three subscales, which together compose the Triangular Love Scale (TLS), has been found to be highly reliable. (Chojnacki & Walsh, 1990; Hendrick & Hendrick, 1989; Sternberg, 1997; Whitley, 1993) though subscales were highly intercorrelated, suggesting poor discriminant validity and questioning the validity of the TLS. (Chojnacki & Walsh, 1990; Hendrick & Hendrick, 1989; Whitley, 1993)

One of the three subscales within the TLS, the Commitment Subscale, was adapted by Harvey et al to be a modified five-item subscale representing a cognitive component of love. It measures the short-term, immediate love for someone, as well as the commitment to maintain love over the long term. In studies, model fit was acceptable, with an SRMR estimate below 0.08 and CFI estimate greater than 0.90. (Harvey et al., 2006)

Dyadic Satisfaction Subscale: The Dyadic Adjustment Scale (DAS) is a 32- item measure used for relationship quality, and was developed by Spanier in 1976. (Spanier, 1976)The DAS has four subscales, including the Dyadic Satisfaction Subscale. This subscale has ten items and measures satisfaction of a relationship. Spanier found that the subscale was valid and reliable, with acceptable factor loadings and an alpha coefficient of 0.94. (Spanier, 1976) A subsequent CFA of the entire DAS found that the Dyadic Satisfaction Subscale had five negative items with high factor loadings on the intended factor, but others did not. (Spanier & Thompson, 1982) The DAS was found to be reliable in a South African population, with a Cronbach's alpha coefficient of 0.85 and 0.79 for women and men respectively. (Lesch & Engelbrecht, 2008)

Constructive Communication Subscale: The Communication Patterns Questionnaire, developed in 1984 by Christiansen and Sullaway, contained the initial components of what would eventually become the Constructive Communication Subscale. (Christensen & Sullaway, 1984) Heavey (1996) created the seven-item Constructive Communication Subscale, which contains three items that assess constructive communication behaviors, and four items that assess destructive communication behaviors. Heavey et al found the

subscale to have high reliability and validity among seventy married couples; the scale had an alpha coefficient of 0.81 among women. (Heavey, Larson, Zumtobel, & Christensen, 1996)

Study context: Fertility preferences and relationship characteristics in Ghana

Nationally, data in Ghana suggest a simultaneous decline in fertility combined with a recent decline of contraceptive use. (GSS & Macro, 2009) Evidence from Ghana supports the idea that individuals' fertility preferences are relatively stable over time (Debpuur & Bawah, 2002; Kodzi, Casterline, et al., 2010; Kodzi, Johnson, & Casterline, 2010), although stability of fertility preferences is highly dependent on how the question is asked. (Debpuur & Bawah, 2002)

In Ghana, marriage is nearly universal, though marriage dissolution has been estimated to be at a quarter of the ever-married women population. (Takyi & Gyimah, 2007) Trends in recent decades show a shift from traditional, arranged marriages toward ones in which men and women choose their own spouses. (Takyi, Miller, Kitson, & Oheneba-Sakyi, 2003) According to the latest DHS in Ghana, polygamous relationships are reported by nearly 20% of women.

Gender dynamics greatly influence sexual and reproductive health decision-making and behaviors among couples in Ghana. Traditional gender scripts—especially men's disapproval of family planning and women's lack of autonomy—negatively influence aspects of reproductive health like contraceptive use and fertility. (Ayaga Agula Bawah, Akweongo, Simmons, & Phillips, 1999; Biddlecom & Fapohunda, 1998, p. 98; Do & Kurimoto, 2012; GSS & Macro, 2009; Sossou, 2006)

Strong gender dynamics influence relationship quality in Ghana. One qualitative study from Cape Coast found that a number of aspects were associated with poorer quality, including certain spousal attributes, family life factors, sociocultural characteristics and structural inequality factors. The authors reported that psychological abuse was commonplace and utilized by both spouses, and they concluded that societal gender norms influence martial conflict and spousal behavior. (Abane, 2003) In an earlier study from the Upper East Region of Ghana, husbands' decision-making had a negative impact on marital quality; traditional gender norms and attitudes, along with wife's employment status, also indirectly impacted marital quality by influencing communication and decision-making. Husbands with less patriarchal attitudes and behavior reported higher quality in their relationship. (N. B. Miller & Kannae, 1999) Kinship ties, which are stronger than marital ties in Ghana, also impact relationship quality: matrilineal and autonomous women are more likely to get divorced compared to nonmatrilineal women, or women with lower autonomy. (Takyi & Broughton, 2006; Takyi & Gyimah, 2007)

A recent study by Cox el al. examined relationship quality using the four previously mentioned scales among married and cohabitating Kumasi couples to understand how different dimensions of quality influence contraceptive use. The authors found a stronger relationship between relationship quality and awareness methods (i.e. methods in which both partners know about the method, including periodic abstinence, withdrawal and condoms) than relationship quality and other methods. In some cases, men's self-evaluation of quality appeared to have more influence on contraceptive use than women's evaluation of quality. (Cox et al., 2013)

Objective of the study

Based on this literature review, the objective of this study is to examine the extent to which fertility preferences change between two points in time, and how relationship quality is associated with observed changes among a sample of women living in peri-urban Ghana. We hypothesize that lower relationship quality results in less stable preferences over time. For example, if a woman perceives her relationship to be of poor quality, she may alter her preferences to improve the relationship. It may be that more children are desired in order to improve the relationship, or fewer are desired in reaction to the poor relationship quality.

Methods

Data and sample

The Family Health and Wealth Study (FHWS) is a multi-country longitudinal open cohort study that examined the individual and household-level health and economic consequences of family size (http://gatesinstitute.org/fhws-landing). The FHWS was conducted in six sites in five sub-Saharan countries (Ghana, Ethiopia, Malawi, Nigeria, and Uganda), and enrolled cohorts ranging from approximately 500 to 1000 couples in each site. In Ghana, the FHWS was implemented in collaboration with the Kwame Nkrumah University of Science and Technology (KNUST), a partner of the Gates Institute of Population and Reproductive Health at the Johns Hopkins Bloomberg School of Public Health. The FHWS in Ghana was approved by the Committee on Human Research Publication and Ethics at KNUST in Kumasi, Ghana and the Institutional Review Boards at Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland.

The study recruited participants from peri-urban areas of each country based on the assumption that contraceptive use in these areas was likely to be moderate, so variations in outcomes due to family size were expected to be observable. The research team randomly selected enumeration areas (EAs) in each study area. Within each EA, the team then completed a household census followed by systematic and random household selection. The FHWS study communities in Ghana were located in Kumasi, the second largest city in the country. Kumasi is part of the Ashanti administrative region. Participants were recruited from the Asokwa sub-metropolitan area, which has an estimated 500,000 inhabitants living in 56 communities (Muntifering, 2011). There were four study sites in this area: Oforikrom (site A), Asawase (site B), Adukrom (site C), and Asokore Mampong (site D).

Inclusion criteria for the Ghana FHWS were: (1) aged 18 to 44 years for women and 18 to 59 years for men, (2) married or cohabitating, and (3) residence within the study area. If one member of the couple did not consent to participate, the team selected another eligible couple from the same household or an adjacent household. One wife was selected randomly for participation in polygamous households or households with multiple families. All participants provided informed consent before research activities began. (Muntifering, 2012) The Ghana FHWS survey was administered separately to coupled men and women in private locations. The survey included questions on contraceptive use, fertility history, fertility preferences, health status, socio-economic status, and relationship quality, among others.

Two rounds of data collection were completed for this study in Ghana, with

approximately 18 months between rounds. The first round of data collection was in 2010. The baseline survey (Round 1) was conducted among 799 couples. The response rate was 96.7%, with 27 couples declining participation. In Round 2, 643 of the original sample were interviewed, which is approximately an 80% follow-up rate. Only women in a relationship (married or cohabitating) with the original Round 1 partner were retained in Round 2. According to study staff, the primary reason for loss to follow-up was relocation out of the study site. Additional interviews were conducted with new participants (n=168 women and 168 men, linked as couples) to maintain a total sample for Round 2 near 800.

Analytic sample

This analysis is limited to the 643 women who participated in both surveys rounds. Twenty women were excluded because they were missing relevant data in Round 2. In addition, of the 14 duplicate identification numbers, we excluded seven women who were not able to be verified across rounds. We additionally removed 4 women with missing data for the dependent variable. Lastly, we excluded 2 women who were missing significant data on the relationship quality measures from Round 1. In total, we excluded 33 women, leaving us with a final analytic sample of 610 women confirmed to be validly linked between rounds. See sample flowchart in **Figure A2.1** in the appendix of this chapter.

There was very little missing data in the final analytic sample (7%). To deal with missingness, we used mean imputation for missing data on the relationship quality scales. No single item on the scales was missing more than five cases. We used Hotdeck imputation, based on age, marital status and education, for the two missing cases on

satisfaction, the six missing for relationship type, and the 31 unable to be categorized for relationship duration.

Variables

Dependent variable: The main dependent variable for this analysis is a change in fertility preferences between rounds. It was created based on women's answers to the same question in two different rounds: Would you like to have (more) children (than you have now)? Answer choices included yes, no and don't know. A binary variable categorized women as having either "no change in preference between rounds" or "yes, a change," based on whether their answer changed between rounds or not. For example, a woman who reported no in both rounds would be categorized as "no change," and a woman who reported no in one round and don't know in another, as having a change.

Questions related to timing of future childbearing were not consistently asked between rounds so that a change in when women intended to have more children could not be examined. Although there was interest in investigating the specific changes between rounds—e.g. from wanting more children to not wanting more, or visa versa—as only 26.6% of the sample experienced a change in preferences over time, there was insufficient power to explore these types of changes in more detail. Refer to **Table A2.1** in the appendix for more information about the nature of changes in fertility preferences between rounds among the analytic sample.

Key independent variable: The key independent variable of interest is a set of scales that measure aspects of relationship quality. These scales were the Dyadic Trust Scale, the Commitment the Dyadic Satisfaction Subscale, and the Constructive Communication

Subscale. The last subscale was analyzed as two separate scales—the Constructive and the Destructive scale—to understand the communication subcomponents independently.

Response categories for individual scale questions are based on Likert-type responses, usually ranging from "not at all" or "strongly agree" to "extremely" or "strongly disagree." Each scale has a different Likert-like response scheme, ranging from 1 to between 6 and 10. Reverse coding existed for some scales. Higher scores indicating better quality. For ease and consistency, we reverse coded the Destructive Communication variable such that increasing scores indicating better quality. We modeled all scale variables as continuous. The items for each scale can be found in **Table A2.2** in the appendix.

Other independent variables: We included other variables that are hypothesized to influence the outcome, a change in fertility preferences. These include demographic characteristics such as the woman's age, duration of relationship with current partner, marital status, type of relationship (i.e. monogamous or polygamous, based on the woman's report), wealth, education, religion and parity. In addition, other events such as a death or birth of a child between rounds and whether currently pregnant were also considered, as they were likely to be associated with the outcome. Wealth was defined through asset ownership and the presence of certain household characteristics for each household through principal components analysis, where scores were placed in rank order and divided into quintiles. Death of a child between rounds was not included in the final models because there were too few cases (only nine total). (Hosmer Jr,

Lemeshow, & Sturdivant, 2013) Other sensitivity analyses suggested to retain both birth in-between rounds and currently pregnant in Round 1.

Analysis

We conducted exploratory and confirmatory factor analysis on the scales using the FHWS-Ghana data to understand the structure of the scales and assess internal consistency. To understand how the independent variables and covariates were independently associated with the outcome, a change in fertility preferences between rounds, we used bivariate and multivariate logistic regression. The multivariate logistic regression adjusted for all the demographic characteristics and other life events such as a birth of a child between rounds. All analyses were adjusted by site to account for the survey design.

All variables with a strong theoretical link to the outcome were kept in the final adjusted model; however, relationship duration was dropped as it was correlated with and theoretically overlapped with age (r=0.73), and was not statistically significant in the bivariate models. All variance inflation factors were under five. (Rogerson, 2001) We conducted all analyses using Stata version12. (StataCorp, 2011)

We assessed selectivity of the analytic sample by assessing differences between women who were excluded from the analysis (n=189) and those remaining in the analytic sample (n=610) on independent variables—i.e. the relationship quality scales and concordance on fertility preferences—and available covariates, using chi2 and t-tests. The excluded women are those lost to follow-up between rounds (n=156), and those with poor data quality, as has been described previously (n=33). **Table A2.3** in the

appendix to this chapter presents the results of the selectivity analysis. Few statistically significant differences were found between excluded women and those who remained in the analytic sample. Compared to women in the analytic sample, excluded women scored higher on the Commitment and Satisfaction scales (average of 37.2 versus 35.8, $p \leq 0.05$, and an average of 4.7 versus 4.5, $p \leq 0.05$), and were of lower parity (2.8 versus 3.2, $p \leq 0.05$).

Results

Relationship quality scales

The results of the factor analyses showed a good fit after re-specifying the scales by dropping items with low factor loadings. Results of the factor analyses are available in **Tables A2.4-A2.5** in the appendix of this chapter. Although the Commitment Subscale remained as originally specified, a 5-item Trust Scale was used in the dissertation analyses instead of the full 8-item scale. The Communication subscale was separated into the 3-item constructive and 4-item destructive subscales. Model fit for the satisfaction scale was poor and could not be improved by dropping items with low factor loadings. Only one item— "how happy are you in your relationship?" —was retained, as it indicated a more universal measure of satisfaction, and had higher standardized factor loadings than other scale items.

We used the re-specified scales for this analysis. All scales had high internal consistency with a Cronbach's alpha of 0.80 or higher. **Table 2.1** shows the standardized Cronbach alpha coefficients for original and re-specified relationship quality scales.

Sample characteristics

Table 2.2 shows the sample characteristics for the FHWS women at Round 1. The majority of women in this analytic sample desired to have more children (n=344, 56.4%), though a few were unsure (n=40, 6.6%). Relationship quality among the analytic sample at Round 1 was high. Mean relationship quality scores were high for the positively scored scales: Trust Scale (mean 25.4 out of 35), Commitment Subscale (mean 35.8 out of 45), Satisfaction (4.5 out of 6), and Constructive Communication Subscale (mean 21.41 out of 30). Scores were high on the Destructive Communication Subscale (mean 36.8 out of 40), indicating high quality on this dimension.

Women in this sample at Round 1 were of mean age 33.7 and had mean number of 3.2 children (not shown). The majority was married (n=573, 93.9%), in monogamous relationships (n=560, 92.7%), and had been in their relationship for a mean of 11.6 years. Most women had at least a primary (n=296, 48.5%) or secondary (n=217, 35.6%) education.

Bivariate analyses

Table 2.3 shows the results of the bivariate associations, from the unadjusted logistic regression models, between the independent variables and the covariates with the outcome, a change in fertility preferences over time. For the relationship quality scales, we found a significant association between the Destructive Communication scale and a change in preferences. With each unit increase in the Destructive Communication score—with increasing scores indicating better relationship quality on this dimension—women were less likely to report a change in preferences between rounds (Odds Ratio

(OR)=0.97, 95% CI 0.95-0.99, p≤0.05). The odds ratios for the remaining scales ranged from 1.00 (Trust) to 1.12 (Satisfaction), but were not statistically significant.

Women with a tertiary level of education, compared to women with no formal education, were less likely to change their preferences between rounds (OR=0.25, 95% CI 0.11-0.53, p≤0.001). Women who had a child between rounds had an increased likelihood of changing their preferences between rounds (OR 1.67, 95% CI 1.05-2.66, p≤0.05).

Multivariate analyses

Table 2.3 also shows the results of the adjusted logistic regression model. In the adjusted model, the coefficient for the Destructive Communication scale remained the same (Adjusted Odds Ratio, AOR=0.97, 95% CI: 0.93-1.02), but the relationship was no longer statistically significant. All other relationship quality scales were not statistically significant in the adjusted model.

There was considerable overlap between the scales despite the fact that they were independent. While all variance inflation factors (VIFs) were under five (Rogerson, 2001), three of the scales were highly correlated with each other: Satisfaction with Commitment (Pearson's r=0.77), Satisfaction and Constructive Communication (r=0.70) and Constructive Communication with Commitment (r=0.74). Therefore to understand the lack of significance for any of our relationship quality scales—specifically the Destructive Communication scale, which had been significant in the unadjusted model—we ran each scale separately while adjusting for the covariates (data not shown). Like the other analyses, these were adjusted for site to account for survey design.

In the models with a single scale, only the model with the single Satisfaction item showed statistical significance for that item (AOR= 1.11, 95% CI 1.02-1.21, p≤0.05). The Commitment score moved closer to no association, from AOR=0.98 with 95% CI 0.94-1.03 in the fully adjusted model to AOR=1.00 with 95% CI 0.99-1.02 in the adjusted model with only the Commitment scale. In each of the other adjusted models, Trust (AOR= 1.01), Destructive Communication (AOR= 0.97) and Constructive Communication (AOR= 1.01) were not statistically significant.

In the fully adjusted model with all five scales, the odds ratio for women with a tertiary level of education, compared to women with no formal education increased slightly (AOR=0.30, 95% CI 0.14-0.65, p≤0.01). Women who had a birth between rounds remained had over twice the odds of having a change in their preference (AOR=2.05, 95% CI 1.38-3.04, p≤0.001). The adjusted association between the youngest women in the sample (ages 18 to 24) and the outcome became significant, compared to women in their 30's (AOR=0.36, 95% CI 0.17-0.74, p≤0.01). In the adjusted model, women in the low wealth quintile had an increase in the likelihood of having a change in their preferences, compared to women in the lowest wealth category (AOR=1.65, 95% CI 1.01-2.69, p≤0.05).

Discussion

Main findings

In this analysis, we explored the factors related to women reporting a change in their fertility preferences over time. Nearly 30% of women changed their fertility preferences in the 18 months between study rounds. This is similar to what was found in other studies in Ghana and Malawi; however, it should be noted that these studies were among women in narrower age bands, measured change over vastly varying periods of time, and asked slightly different questions to measure fertility preferences. (Debpuur & Bawah, 2002; Kodzi, Casterline, et al., 2010; Machiyama et al., 2015; Sennott & Yeatman, 2012; Yeatman et al., 2013)

There were few significant relationships between the relationship quality scales at baseline and future change in fertility preferences. While we noted a correlation between increasing Destructive Communication scale scores (indicating better relationship quality) and a change in preferences, this relationship was not statistically significant when the other scales and covariates were added to the model. In the model with only the Satisfaction item, it appeared that an increase in relationship quality in this domain was associated with higher odds of changing preferences but this association did not hold up after adjustment for the other scales.

There is no literature available on how relationship quality impacts fertility preferences and little understanding about relationship quality generally in the African context to help explain these results. Most likely, the lack of findings among our independent variables is related to the limitations in our dependent variable. These limitations are described in more detail below.

Another reason for these findings could be that specific aspects of relationship quality may be more or less important in this context than what the scales used in this analysis measured. For example, one study from a rural, agricultural community in Ghana with a patriarchal culture found that, for women's well-being, it was important to have a marriage characterized by "affection and support." (Bull, Duah-Owusu, & Autry Andvik, 2010) Muntifering's qualitative work found that the qualities of patience and understanding resonated strongly among men and women in Kumasi, Ghana. (Muntifering, 2012) Aspects such as affection, support, patience, and understanding are not captured in these scales.

Lastly, it could also be that other aspects beyond relationship quality matter more for changing preferences, such as individual-level characteristics like self-efficacy, or subjective norms. We also do not know how women answered this question; culture can influence how women conceptualize their own fertility. (Johnson-Hanks, 2007; Agadjanian 2005)

In terms of the other covariates, having a birth between rounds was associated with a change in preferences. Younger women were significantly less likely to change preferences, which may account for where these women are in the reproductive life cycle. While these associations were in the expected direction, many of the other covariates had no statistically significant association with the outcome. This may be due to limitations with the outcome measure (described below), some attrition between rounds, and other unmeasured factors.

Limitations and strengths

The most significant limitation of our analysis is that we could not analyze the type of change in fertility preferences over time. With only approximately a quarter of the sample reporting different fertility preferences in the two rounds, we did not have enough people in each category to conduct a detailed analysis of all the potential categories of change. Specifically, we were unable to assess different types of change, e.g. changing from not wanting more children to wanting more children, and it is unlikely that these different types of change hold the same meaning. Relatedly, among those who changed preferences, combining women who had a birth in-between rounds with those who did not have a birth may result in combing women with very different reasons for changing preferences. Due to sample size limitations we were unable to stratify by birth, though we did adjust for it in the final models. These limitations may explain why we not only did not see a relationship between our independent variable and our outcome, nor for the covariates such as parity or other age categories.

Although we had two timepoints, which improves on cross-sectional analyses, the year and a half between survey rounds may eclipse the variation in preferences in the short-term. However, intervals of at least a year have been used by other researchers. (Bankole & Westoff, 1998; Schoen, Astone, Kim, Nathanson, & Fields, 1999; Westoff & Ryder, 1977) Ideally, we would have been able to measure key life events between rounds, so that changes in preferences could be explained in tandem with these key life events as was done in Malawi. (Sennott & Yeatman, 2012) We were able to include key variables such as birth or death of a child between rounds, though too few women experienced the death of a child to include that measure in our analysis.

There was attrition between rounds; nearly 20% of women who participated in Round 1 did not participate in Round 2. Oral field reports indicate that a major reason for nonparticipation in Round 2 was due to migration and partnership dissolution with the Round 1 partner, which was an eligibility criterion for study participation. Sensitivity analyses showed that women who dropped out had higher relationship quality on the satisfaction and commitment scales, and were of lower parity. This finding has some potential implications in terms of sample selectivity for this analysis, potentially underestimating the association between relationship quality and a change in preferences.

There could be unobservable confounding related to unmeasured factors. As fertility preferences rest in a dynamic context, variables related to financial stability, health events past and present, perceptions of health in the future, and other relationship aspects could also directly impact fertility preferences. Future research could assess other aspects from the relationship context, and qualitative data could provide more in-depth understanding of different types of life events and individual and relationship mechanisms are linked to a change in preferences over time.

Despite limitations, there were a number of strengths to this analysis. First, having two rounds of data allowed us to measure the change in fertility preferences over time in the same individuals. We were also able to adjust for a number of important covariates that are theoretically related to a change in preferences, such as birth of a child between rounds. This is the first study that we know of that investigates the relationship between relationship quality and a change in fertility preferences over time.

Conclusion

Fertility preferences is a complex, nuanced, dynamic construct that is ubiquitously utilized to target programs and research. Our analysis highlights that fertility preferences in our peri-urban sample reflect what may be frequent changes in the preferences of couples. This frequent shifting may be connected to the low and inconsistent use of contraceptive we observe in Ghana. Some women—especially those whose changing preferences do not align with their lifetime fertility goals—may be more like to use temporary or less effective methods of pregnancy prevention, or resort to abortion to have their actual fertility match their preferences in the Ghanaian context. Additional research should explore whether the changes in preferences reflect true fluctuations in preferences, or short-term contextual and partnership factors as well as the impact of preferences on contraceptive behavior and relationship stability.

Chapter 2 References

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Table 2.1: Standardized Cronbach alpha coefficients for original and re-specified relationship quality scales

	Original scale	Re-specified scale
Trust scale	0.8	0.89
Commitment subscale	0.96	n/a
Satisfaction subscale	0.77	n/a
Communication subscale	0.8	n/a
Constructive communication subscale	n/a	0.83
Destructive communication subscale	n/a	0.85

N/A=not applicable

Table 2.2: Descriptive statistics of the FHWS sample by a change in fertility preferences between rounds (n=610)

	n (%) or mean (SD)
Key dependent variable	
Change in fertility preferences between rounds, n (%)	
No change	448 (73.4)
Yes, a change	162 (26.6)
Key independent variable^	
RQ scale (Trust) (n=606), mean (SD) - *max score 35*	25.4 (4.6)
RQ scale (Commitment) (n=605), mean (SD) -*max score 45*	35.8 (8.6)
RQ scale (Constructive communication), mean (SD)-*max score 30*	21.4 (8.0)
RQ scale (Destructive communication) (n=607), mean (SD) - *max score 40*	36.8 (5.45)
RQ scale (Satisfaction) (n=608), mean (SD) - *max score 6*	4.46 (1.3)
Age, n (%)*	
Age 18-24	120 (19.7)
Age 25-29	51 (8.4)
Age 30-39	300 (49.2)
Age 40+	139 (22.8)
Wealth, n (%)	
Lowest quintile	116 (19.0)
Low quintile	118 (19.3)
Middle quintile	131 (21.5)
High quintile	116 (19.0)
Highest quintile	129 (21.2)
Education, n (%)	
No formal	77 (12.6)
Primary	296 (48.5)
Secondary	217 (35.6)
Tertiary	20 (3.3)
Religion, n (%)	
Christian^^	338 (55.4)
Muslim	272 (44.6)
Marital Status, n (%)	
Married	573 (93.9)
Living together	37 (6.1)
Parity, n (%)	

Parity 0	26 (4.3)
Parity 1-3	333 (54.6)
Parity of 4 or more	251 (41.2)
Relationship type (n=604), n (%)	
Monogamous	566 (92.8)
Polygamous	44 (7.2)
Birth between rounds, n (%)***	
No birth of a child between rounds	453 (74.3)
Birth of a child between rounds	157 (25.7)
Currently pregnant at Round 2, n (%)	
Not currently pregnant	554 (90.8)
Currently pregnant	56 (9.2)
Site, n (%)	
Site A	159 (26.1)
Site B	160 (26.2)
Site C	144 (23.6)
Site D	147 (24.1)

^Total N is 610 unless otherwise noted

^^Other includes two women reporting either "other" or "traditional"

Table 2.3: Results of the unadjusted and adjusted logistic regressions modeling the odds ratios (ORs) of a change in fertility preferences over time (n=610)

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Key independent variables		
Commitment scale	1.01 (1.00-1.01)	0.98 (0.94-1.03)
Trust scale	1.00 (0.97-1.03)	1.00 (0.97-1.03)
Destructive communication scale	0.97 (0.95-0.99)*	0.97 (0.93-1.02)
Constructive communication scale	1.01 (0.99-1.03)	0.99 (0.95-1.04)
Satisfaction scale	1.12 (0.99-1.27)	1.24 (0.95-1.62)
Other independent variables		
Age (ref= ages 30-39)		
Age 18-24	0.57 (0.30-1.08)	0.36 (0.17-0.74)**
Age 25-29	0.72 (0.38-1.36)	0.55 (0.28-1.10)
Age 40+	0.74 (0.53-1.04)	0.73 (0.52-1.03)
Wealth (ref=Lowest quintile)		
Low quintile	1.43 (0.95-2.16)	1.65 (1.01-2.69)*
Middle quintile	1.10 (0.54-2.26)	1.20 (0.57-2.59)
High quintile	1.36 (0.64-2.85)	1.41 (0.61-3.28)
Highest quintile	0.87 (0.46-1.67)	1.09 (0.48-2.50)
Education (ref= no formal)		
Primary	0.78 (0.47-1.29)	0.81 (0.43-1.51)
Secondary	0.82 (0.52-1.30)	0.89 (0.52-1.51)
Tertiary	0.25 (0.11-0.53)***	0.30 (0.14-0.65)**
Religion (ref=Christian^)		
Muslim	1.40 (0.88-2.20)	1.45 (0.71-2.93)
Marital Status (ref=married)		
Living together	1.03 (0.48-2.19)	1.17 (0.45-3.02)
Parity (ref=parity 1-3)		
Parity 0	0.38 (0.54-2.70)	0.45 (0.06-3.33)
Parity of 4 or more	1.22 (0.83-1.80)	1.28 (0.93-1.76)
Relationship type (ref=monogamous)		
Polygamous	0.69 (0.19-2.51)	0.58 (0.14-2.34)
Birth between rounds (ref=no birth)		
Birth of a child between rounds	1.67 (1.05-2.66)*	2.05 (1.38-3.04)***
Currently pregnant round 2 (ref=not currently pregnant)		
Currently pregnant	1.48 (0.48-4.46)	1.77 (0.65-4.80)

^Christian includes two women who reported "other" or "traditional"

**p ≤0.05 ; ** p ≤0.01; *** p ≤0.001*

All analyses adjusted for site

Appendices to Chapter Two

F

Figure A2.1: Flowchart for the Ghana FHWS Analytic Sample for Aim 1

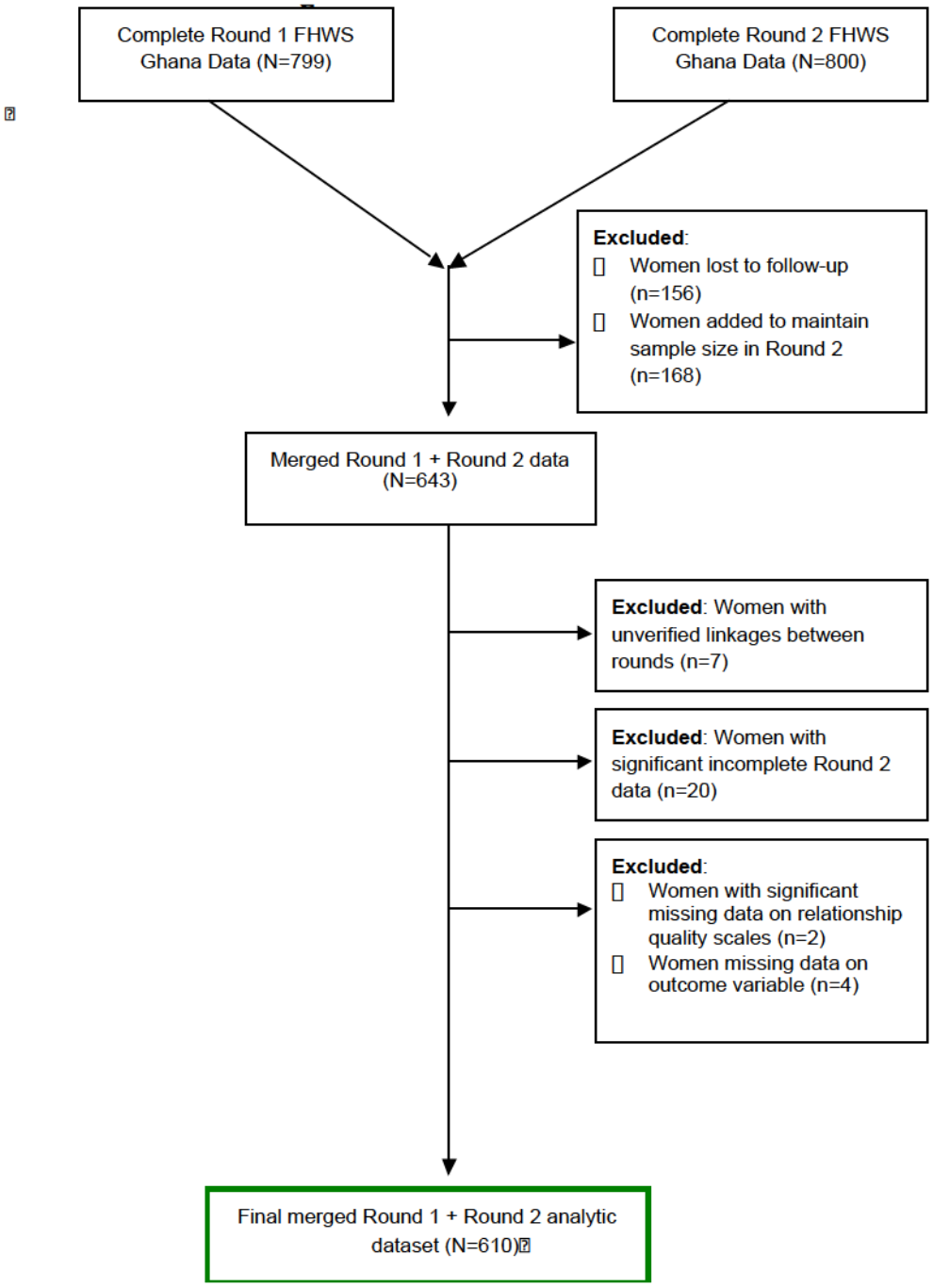

Table A2.1: Nature of changes in fertility preferences between rounds among the final FHWS sample (n=610)

Status	n (%)
A change between rounds (total)	*162 (26.6)*
Changed from wanting more children to not wanting more	76 (12.5)
Changed from not wanting more children to wanting more	35 (5.7)
Changed from "don't know if wants more children" to either wanting or not wanting more OR from either wanting or not wanting more to "don't know"	51 (8.4)
No change between rounds (total)	*448 (73.4)*

Table A2.2: Relationship quality scale questions and range of possible responses used in the FHWS

Trust Scale (range: 1 "strongly agree" to 7 "strongly disagree")	
	My partner is primarily interested in his own welfare
	There are times when my partner cannot be trusted
	My partner is perfectly honest and truthful with me
	I feel I can trust my partner completely
	My partner is truly sincere in his promises
	I feel that my partner does not show me enough consideration
	My partner treats me fairly and justly
	I feel that my partner can be counted on to help me
Commitment Subscale (range: 1 "not at all" to 9 "extremely")	
	I expect my love for this partner to last for the rest of my life
	I can't imagine ending my relationship with this partner
	I view my relationship with this partner as permanent
	I am committed to maintaining my relationship with this partner
	I have confidence in the stability of my relationship with this partner
Satisfaction Subscale (range: 1 "Never" to 6 "all of the time")	
	How often do you discuss or have you considered divorce, separation or terminating your relationship?
	How often do you or your partner leave the house after a fight?
	In general, how often do you think that things between you and your partner are going well?
	Do you confide in your partner?
	Do you ever regret that you married?
	How often do you and your partner quarrel?
	How often do you and your partner "get on each other's nerves?"
	How often do you kiss/hug/embrace your partner?
	Please rate how happy you are in your relationship
	Please rate your feelings about the future of the relationship
Constructive Communication Subscale (range: 1 "very unlikely" to 7 "very likely")	
	We try to discuss the problem (Constructive)
	We express their feelings to each other (Constructive)
	We suggest possible solutions and compromises (Constructive)
	We blame, accuse and criticize each other (Destructive)
	We threaten each other with negative consequences (Destructive)
	I call my partner names, swear at him/her, or attack his/her character (Destructive)
	My partner calls me names, swears at me, or attacks my character (Destructive)

Table A2.3: Selectivity of the analytic sample

	Excluded sample (N=189)	**Analytic sample (N=610)**
Key variables from Round 1	**mean (sd) /proportion**	**mean (sd) /proportion**
Would you like to have more children? n, (%)		
Yes, more	119 (65.4)	344 (56.2)
No more	54 (29.7)	226 (37.1)
Don't know	9 (5.0)	40 (6.7)
N	182	610
RQ scale (Trust), mean (SD)	25.6 (4.22)	25.4 (4.58)
N	185	606
RQ scale (Commitment), mean (SD)*	37.2 (8.02)	35.8 (8.59)
N	185	605
RQ scale (Constructive communication), mean (SD)	22.0 (7.66)	21.4 (8.02)
N	185	610
RQ scale (Destructive communication), mean (SD)	6.9 (4.68)	7.2 (5.45)
N	185	607
RQ scale (Satisfaction), mean (SD)*	4.7 (1.23)	4.5 (1.31)
N	187	608
Age, mean (SD)	33.0 (6.64)	33.7 (6.45)
N	189	610
Parity, mean (SD)*	2.8 (1.90)	3.2 (1.67)
N	182	610
Education, n (%)		
No formal	25 (13.7)	77 (12.6)
Primary	76 (41.8)	296 (48.5)
Secondary	78 (42.9)	217 (35.6)
Tertiary	3 (1.7)	20 (3.28)
N	182	610
Marital Status, n (%)		
Married	172 (91.0)	573 (93.9)
Living together	17 (9.0)	37 (6.1)
N	189	610
Relationship duration, mean (SD)	10.8 (8.00)	11.6 (7.21)
N	180	579
Relationship type, n (%)		
Monogamous	172 (93.0)	562 (92.7)
Polygamous	13 (7.0)	44 (7.3)
N	185	606
Site, n (%)		
Site A	43 (22.8)	159 (26.1)
Site B	38 (20.1)	160 (26.2)
Site C	58 (30.7)	144 (23.6)
Site D	50 (26.5)	147 (24.1)

N	189	610
Wealth, n (%)		
Lowest quintile	42 (23.1)	117 (19.0)
Low quintile	44 (24.2)	117 (19.3)
Middle quintile	26 (14.3)	131 (21.5)
High quintile	41 (22.5)	116 (19.0)
Highest quintile	29 (15.9)	129 (21.2)
N	189	610

*p ≤0.05 ; ** p ≤0.01; *** p ≤0.001

Table A2.4: Standardized factor loadings from original and re-specified scales

		Original*	Re-specified
Trust scale			
	My partner is primarily interested in her own welfare	0.17	*dropped*
	There are times when my partner cannot be trusted	0.31	*dropped*
	My partner is perfectly honest and truthful with me	-0.82	0.86
	I feel I can trust my partner completely	-0.84	0.85
	My partner is truly sincere in her promises	-0.76	0.75
	I feel that my partner does not show me enough consideration	0.23	*dropped*
	My partner treats me fairly and justly	-0.83	0.81
	I feel that my partner can be counted on to help me	-0.66	0.67
Commitment subscale			
	I expect my love for this partner to last for the rest of my life	0.93	N/A
	I can't imagine ending my relationship with this partner	0.76	N/A
	I view my relationship with this partner as permanent	0.93	N/A
	I am committed to maintaining my relationship with this partner	0.98	N/A
	I have confidence in the stability of my relationship with this partner	0.96	N/A
Satisfaction subscale			
	How often do you discuss or have you considered divorce, separation or terminating your relationship?	0.36	Dropped
	How often do you or your partner leave the house after a fight?	0.27	Dropped
	In general, how often do you think that things between you and your partner are going well?	-0.42	Dropped
	Do you confide in your partner?	-0.48	Dropped
	Do you ever regret that you married?	0.19	Dropped
	How often do you and your partner quarrel?	0.11	Dropped
	How often do you and your partner "get on each other's nerves?"	0.10	Dropped
	How often do you kiss/hug/embrace your partner?	0.26	Dropped
	Please rate how happy you are in your relationship	-0.94	Retained as single item
	Please rate your feelings about the future of the relationship	-0.91	Dropped
Constructive Communication Subscale**			
	We try to discuss the problem (Constructive)	*0.92 (F2)*	*Constructive scale*
	We express their feelings to each other (Constructive)	*0.60 (F2)*	*Constructive scale*
	We suggest possible solutions and compromises (Constructive)	*0.92 (F2)*	*Constructive scale*
	We blame, accuse and criticize each other (Destructive)	0.53	Destructive scale
	We threaten each other with negative consequences (Destructive)	0.93	Destructive scale

	I call my partner names, swear at him/her, or attack his/her character (Destructive)	0.92	Destructive scale
	My partner calls me names, swears at me, or attacks my character (Destructive)	0.84	Destructive scale

**Loadings for Factor 1 unless otherwise noted*

***Re-specified Constructive Communication subscale divided into two smaller scales, a three-item Constructive Communication subscale and a four-item Destructive Communication subscale.*

Table A2.5: Goodness of fit of original and re-specified scales from the confirmatory factor analysis

	CFI	TLI	SRMR	RMSEA
Trust scale				
Original	0.89	0.85	0.07	0.12
Re-specified	0.96	0.92	0.03	0.15
Commitment subscale				
Original	0.99	0.99	0.01	0.06
Satisfaction subscale				
Original	0.54	0.41	0.15	0.22
Constructive Communication subscale				
Original	0.96	0.93	0.08	0.12
Constructive Communication subscale (3 items)				
Original	1	1	0	0
Destructive Communication subscale (4 items)				
Original	0.99	0.97	0.02	0.12

Cutoff points (for poor fit)

CFI and TLI: ≤ 0.90; SRMR: ≤ 0.08; RMSEA: ≤0.10

CHAPTER THREE:

MANUSCRIPT TWO

Women's participation in household decision-making and their perceptions of their partners' fertility preferences in Ghana

Introduction

Fertility preferences refer to an individual's desire for more children. (DHS Program, 2015) The measure is used in reproductive and population research, and in large-scale surveys, such as the Demographic and Health Surveys (DHS). Fertility preferences are important at the aggregate level for projecting future fertility trends and evaluating family planning programs and policies, as well as for understanding childbearing and contraceptive use among individuals and couples. (Debpuur & Bawah, 2002; Morgan & Rackin, 2010; Santelli et al., 2003; Westoff & Ryder, 1977)

How members of a couple communicate their preferences to each other about current or future fertility is critical to whether pregnancy is planned, unplanned, wanted or unwanted. (Miller, Severy, & Pasta, 2004) If communication is successful, members of a couple discuss their individual preferences, and if in disagreement, they may attempt to arrive at a mutually agreeable solution. One important aspect of communication is the resulting perception that each partner has of the other's fertility preferences. Theoretically, successful communication about one's fertility preferences would lead each partner to have accurate perceptions.

Much of the literature on the accurate perceptions has focused on perceived attitudes about family planning. Men seem to perceive their wives' approval of family planning more accurately than wives perceive their husbands' approval. According to a review about couples and fertility in six developing countries, Becker found that husbands were slightly more likely to know whether their wives approved of family planning than wives were to know of their husband's attitudes. (Becker, 1996) Numerous studies have shown that women think their husbands are opposed to family planning use when they actually

approve of it. (Ayaga A. Bawah, 2002; Kimuna & Adamchak, 2001; A. Lasee & Becker, 1997; Toure, 1996)

Having accurate perceptions of a partner's preferences is important when it comes to outcomes like contraceptive use. In Kenya, wives' perception of their husbands' attitudes statistically correlated with contraceptive uptake (A. Lasee & Becker, 1997) more so than their own approval of contraception. (A. A. Lasee, 1994) In a more recent study, male and female Kenyans who perceived their partners to prefer fewer children than they did had nearly twice the odds of using modern contraception than those who had concordant fertility preferences or other discordant preferences. (Tumlinson et al., 2013)

There are limited studies in Africa that have assessed the accuracy of perceptions of partner's fertility preferences. We know contraceptive and fertility behaviors are often guided by what women think their partners want; especially, in contexts where gender norms influence women to be deferential to their partners, or afford them lower autonomy and negotiation power in their relationships. With a better understanding of women's perceptions of their partner's fertility preferences, as well as what may increase their likelihood of having accurate perceptions, we can better understand how women and couples can make reproductive decisions that are both desirable and desired.

Women's participation in household decision-making

A key aspect related to couple communication about fertility-related matters is how empowered women are in their relationship to speak about their reproductive preferences, preferences and desires. One way by which researchers have sought to understand women's empowerment in the DHS is through women's participation in household decision-making. These questions inquire about who makes the final decision in matters such as household purchases (large and daily); women's ability to visit family, relatives and/or friends; women's own health care, and how the husband's earnings are spent. Women can report that they made these decisions alone, jointly with husband/partner, or that they had no say. Theoretically, having greater participation in these types of decisions translates into greater autonomy over other aspects of life, including fertility matters.

Indeed, women who have a say in household decision-making are also more likely to adopt modern contraception, although it should be noted these are cross-sectional studies so causality cannot be inferred. (Do & Kurimoto, 2012; Hogan, Berhanu, & Hailemariam, 1999; OlaOlorun & Hindin, 2014; Schuler & Hashemi, 1994; Woldemicael, 2009) Conversely, among couples where men made the final decisions and women had no say, women were less likely to approve of family planning, use a modern method, discuss fertility preferences with their spouse, and were more likely to have children. (Do & Kurimoto, 2012; Hindin, 2000; Mistry, Galal, & Lu, 2009; OlaOlorun & Hindin, 2014)

Study context

Nationally, data in Ghana suggest a simultaneous decline in fertility combined with a recent decline of contraceptive use. (GSS & Macro, 2009) Among currently married women in Ghana, 36% would like to wait two or more years before their next birth, and the same

percentage do not want another child. The desire to space births has declined from 45% to 36% over the last five DHS reports, and the desire to limit increased from 23% to 35% between 1988 and 2008. Ideal family size has decreased over time, from a mean of 5.5 children in 1988 to 4.6 children in 2008. (GSS & Macro, 2009)

There is little data on how accurately women perceive their partner's fertility preferences in Ghana. According to an older report, 61% of wives correctly identified their husband's attitudes about family planning. (Salway, 1994) Couples' communication on reproductive and fertility matters has repeatedly been shown to influence subsequent contraceptive uptake in Ghana. (Avogo & Agadjanian, 2008; Ayaga A. Bawah, 2002; Salway, 1994; Tawiah, 1997) However, spousal communication on family planning is reportedly low in Ghana, with the percentage of women reporting never speaking to their husbands about family planning ranging from 57.9% in 1988 to 41.3% in 2003. (Ghana Statistical Service, 2004) This question does not appear to be asked in the 2008 DHS survey. (GSS & Macro, 2009)

Gender dynamics greatly influence sexual and reproductive health decision-making and behaviors in Ghana. Traditional gender scripts—especially men's disapproval of family planning and women's lack of autonomy—negatively influence aspects of reproductive health like contraceptive use and fertility. (Ayaga Agula Bawah, Akweongo, Simmons, & Phillips, 1999; Biddlecom & Fapohunda, 1998, p. 98; DeRose, Dodoo, & Patil, 2002; Do & Kurimoto, 2012; GSS & Macro, 2009; Sossou, 2006) Polygamous relationships in Ghana have been shown to be more gender-inequitable than monogamous relationships. (Agadjanian & Ezeh, 2000)

In terms of women's empowerment in Ghana as measured by their participation in household decision-making, trends over the years suggest that women are gaining some autonomy, though men still continue to make some decisions without participation by the wife/partner. According to the 2003 DHS in Ghana, husband's making the final decision ranged from 31.8% on daily household needs to 40.9% for large household needs; in 2008, this ranged reduced to 15.7% for visits to family to 36.6% for large household needs. (Ghana Statistical Service, 2004; GSS & Macro, 2009) In a DHS analysis by Do and Kurimoto's, overall empowerment (which combined the participation in decision-making variables with other empowerment variables) in Ghana was associated with couple contraceptive methods (e.g. male and female condoms). In the fully adjusted models, the ability to negotiate sexual activity was strongly associated with a couple or female methods (e.g. pill, IUD), as opposed to no method use. (Do & Kurimoto, 2012)

Study aims:

Using data from coupled women in the 2008 Ghana DHS, our aim was to understand the association between women's empowerment, as measured by their participation in household decision-making, and their perceptions of their partners' fertility preferences. We first explore the association between women's empowerment and women's perceptions of partner fertility preferences. As it is possible that couple communication is related to both empowerment and perceptions, we further explore whether family planning communication is in the causal pathway. We hypothesize the following:

(1) Women with low participation (i.e., have no say) in household decision-making are more likely to have inaccurate or unknown perceptions of a partner's fertility preferences, compared to women with at least some participation in decision-making.

(2) The association between decision-making and accurate perceptions is mediated by couple communication.

It should be noted that while we use the term "mediate," we are not testing for true mediation as we only have cross-section data available for this analysis.

Methods

Data

The study sample for this analysis comes from the 2008 Ghana Demographic and Health Survey (DHS). The Ghana Statistical Services and the Ghana Health Service conducted the data collection. It is the fifth iteration of the survey conducted in Ghana as part of the worldwide DHS program. The primary purpose of the DHS is to collect information related to fertility, marriage, sexual activity, fertility preferences and family planning use, breastfeeding practice, maternal and child health, among other topics.

The 2008 Ghana DHS was conducted on a nationally representative probability sample of 12, 323 households, in ten regions of Ghana across all sectors of wealth and in both urban and rural areas. The DHS relied on a two-stage sample design. In the first stage, 412 clusters were randomly selected (systematic sampling with probability proportionate to size) from a sampling frame, which came from the 2000 Ghanaian national census. As a lead up to the second stage, a household listing process was conducted in 411 clusters (one cluster was removed due to security reasons) to provide the sampling frame. In the second stage, 30 households per cluster were systematically sampled. Weights were calculated in order to

consider cluster, household, individual non-response as well as over and under-representation.

Eligible households included residences with women ages 15-49 and men ages 15-59. The Household Questionnaire collected basic information on members of the household, and was used as a screener to find participants for the Women and Men's Questionnaires. Of the 12,323 households eligible for participation, 11,913 were occupied (i.e. non-vacant) during fieldwork. Among the 50 percent of households selected for participation, 5,096 women and 4,769 men were eligible, and 4,916 women and 4,568 men completed the interview. Non-response was mostly due to failure to find individuals at home. (GSS & Macro, 2009)

Analytic sample

Of the 4,916 currently married or cohabitating women aged 15 to 49, the sample for this analysis was first restricted to women whose partners participated in the survey (n=1,884). There were a number of exclusions to arrive at the final analytic sample. Forty-one women did not answer the question about perceptions of their partner's preferences, including the 34 sterilized women who were not asked this question. We included seven of the twenty-four infecund women who reported that they did not know their partner's preferences as "don't know;" however, we could not make assumptions about the remaining infecund women and we therefore excluded these women. We excluded those women with "no response" to their partner's preferences (n=7). After these exclusions, we additionally removed 14 men who reported being sterilized, infecund, or did not answer the question about their own preferences. Some women were excluded for multiple reasons. This led to a total of 71 women excluded from the analysis based on the outcome variable of interest.

We excluded from the analytic dataset the 25 women unable to be categorized for the independent variable—participation in decision-making—and an additional 29 women with missing data. The final analytic sample was 1,759 currently married or cohabitating women aged 15 to 49 (see sample flowchart in **Figure A3.1** in the appendix of this chapter). Women are considered the unit of analysis although the outcome variable is measured using the women's and the men's data.

Measures

Outcome variable:

The outcome variable for this analysis was the woman's perception of her partner's fertility preferences. The construct was based on how women and their partners answer the fertility preferences question: "Would you like to have (a/another) child, or would you prefer not to have any (more) children?" Answer options were: have (a/another) child, have no more/none, undecided, cannot get pregnant (infecund), or sterilized. For some determinations, we used women's data from the question "Does your husband/partner want the same number of children that you want, or does he want more or fewer than you want?" Answer choices to this later question included: "we both want the same," "husband wants more," "husband wants fewer," or "don't know."

We constructed a three-category variable: accurate perception, inaccurate perception, and unknown perception. The accuracy of women's perceptions was defined by the alignment between the partners' own fertility preferences and the women's perception of their partner's preferences. For example, a woman reporting that she wanted more children and that her partner wanted the same, whose partner reported that he wanted more children, was categorized as having accurate perceptions. If there was any mismatch, women were

categorized as having inaccurate perceptions. For example, a woman reporting that she thought that her partner wanted more children, but her partner reported that he was undecided, was categorized as having inaccurate perceptions. Finally, all women reporting they did not know their partner's preferences were categorized as having an unknown perception (see **Table A3.1** in the appendix of this chapter**).**

The sample was not large enough to assess further details about inaccurate perceptions, e.g. women who think their partners wants more when they do not want more, or women who think their partners do not want more children when they do.

Key independent variables

Woman's participation in household decision-making: The primary independent variable of interest was women's participation household decision-making. It was based on five DHS questions, as follows:

"Who usually…

1. Decides how your husband's/partner's earnings will be used?
2. Makes decisions about making major household purchases?
3. Makes decisions about making purchases for daily household needs?
4. Makes decisions about visits to your family or relatives?
5. Makes decisions about health care for yourself?"

Answer choices included (a) respondent, (b) husband/partner, (c) respondent and husband/partner jointly, (d) someone else and (e) other.

Previous work has shown that participation in decision-making is not a single, undifferentiated notion, and that each item contributes uniquely. (Kishor & Subaiya, 2008). We conducted a number of analyses including principal component analysis (PCA) to ascertain the best way to define and utilize women's participation in household decision-making as an independent variable. We considered a simple additive index and an index with cutpoints. Ultimately, we decided to use each item as a binary variable. Each of the five items was converted into a binary variable: women who had no say in the decision (1) vs. those who had sole or joint decision with their partner (0). Women who reported "other" or "someone else" were categorized as having no say in the decision. This categorization was done in order to identify women who had the least power in household decision-making, in line with the research objective of understanding how low participation in decision-making correlates with accuracy of partner's fertility preferences.

Twenty-five women were missing or unable to be categorized on the independent variable, including. A sensitivity analysis was conducted to determine if these 25 women impacted the analysis. For each of the five decision-making dummy variables, all missing data was first categorized as a 0, and then as a 1, to see if bivariate analyses with the outcome would statistically change. Results remained robust regardless of the category these women were included in; therefore, these women were excluded for this analysis.

Discussion of family planning: The second independent variable of interest was discussion of family planning. It was based on the only available variable in the couples' dataset on this aspect, asked to men only: "In the last few months, have you discussed the practice of family planning with your wife/ cohabiting partner?" This variable was coded as a binary variable, where 1 indicated discussion about family planning with wife/partner in the last few

months and 0 indicated no discussion. There were five women whose partners did not answer this question in the dataset, and they were dropped from the analysis.

Other independent variables

Variables expected to be related to a woman's participation in decision-making, or women's perceptions of her partner's fertility preferences include women's *individual-level characteristics* (age, religion, parity, education, and employment status); *couple-level characteristics* (relationship duration, marital status, and polygamous status); and *household-level characteristics* (wealth and residence). Due to colinearity with age, relationship duration was removed from the analysis.

Missing data were limited overall. Five women were missing on the continuous education variable, and their number of years of completed education was averaged from the answer to their categorical education response. The 18 women who reported "unsure" or were missing on polygamous status were excluded from the analysis, as were the six missing on religion. Sensitivity analyses with the outcome were conducted for each of these variables, in which all excluded were categorized in each category of the variable. For example, all 18 excluded in polygamous were first included as polygamous, then as monogamous, and compared to the variable version without them. Results remained robust regardless of the category these women were included in; therefore, we excluded these 24 women from this analysis.

Analysis

We conducted this analysis in several steps. First, we used bivariate analyses to evaluate the associations between participation in household decision-making as well as individual,

couple and household covariates with the outcome measure, accuracy in knowing partner's fertility preferences. Next, we explored the relation between couple communication and decision-making, and couple communication and accuracy, to assess mediation. Then we conducted multinomial logistic regressions to explore both the overall association, and mediation. We weighted all analyses to consider cluster, household, individual non-response as well as over and under-representation. We conducted all analyses using Stata version 11. (StataCorp, 2009)

Results

Sample characteristics are presented in **Table 3.1** for 1,759 women. Women were on average 32.3 years of age. The majority (90.7%) of the sample was employed and had an average 5.2 years of education. The majority lived in rural areas (59.3%) and 70.9% of women were of Christian faith. The majority of respondents were married (82.6%) and in a monogamous relationship (83.8%). Mean average parity in the sample was 3.0 children.

In the sample, 959 women (55.8%) had accurate perceptions, 355 (21.3%) had inaccurate perceptions, and 445 (22.9%) had unknown perceptions of their partners fertility preferences. Having no say in a decision ranged from 17.5% (visits to family) to 54.2% (what to do with husband's earnings). Almost six percent of the sample (n=110) had no say in any decision (data not shown). Nearly 60% of women had partners reporting no discussion about family planning in the last few months.

Bivariate analysis

Table 3.2 shows the results from the unadjusted multinomial logistic regressions of sample characteristics and the outcome, having inaccurate or unknown perceptions of a partner's fertility preferences, compared to women with accurate perceptions. Women who had no say in what to do with their husband's earnings were significantly more likely to report having unknown perceptions of their partners' fertility preferences, compared to women with accurate perceptions (Odds Ratio (OR)= 1.98, 95% CI 1.51-2.58, p≤0.001). None of the other decision-making variables were significantly associated with perceptions.

Several other covariates were significantly associated with having inaccurate or unknown perceptions of a partner's preferences, compared to women with accurate perceptions. Notably, women whose partners reported having discussed family planning with them in the last few months was associated with a decreased odds in having unknown perceptions (OR=0.72, 95% CI 0.54-0.95, p≤0.05). Women of Muslim faith and of traditional/other religious background, as compared to Christian women, had twice the odds of having unknown partner perceptions (OR =2.39, 95% CI 1.71-3.32, p≤0.001 and OR =1.78, 95% CI 1.00-2.98, p≤0.05, respectively). Polygamous women, compared to their monogamous counterparts, were at a two-fold odds of having unknown perceptions (OR =2.10, 95% CI 1.44-3.06, P≤0.001).

Additionally, there was an increase in odds for inaccurate and unknown perceptions for each additional child (OR =1.10, 95% CI 1.04-1.18, p≤0.01 for inaccurate, and OR =1.08, 95% CI 1.00-1.15, p≤0.05 for unknown). Education (OR =0.89, 95% CI 0.85-0.91, p≤0.001), wealth (OR =0.74, 95% CI 0.66-0.81, p≤0.001) and urban residence (OR =0.52, 95% CI 0.36-

0.71, p≤0.001) were significantly associated with a reduced odds of unknown perceptions, compared to women with accurate perceptions.

Table 3.3 shows the results of the bivariate analyses (using unadjusted multinomial regression) of the mediation analysis. Women with unknown perceptions, as compared to women with accurate perceptions, were much less likely to have had a male partner report a discussion about family planning (OR =0.71, 95% CI 0.54-0.95, p≤0.05). The relation between women with inaccurate perceptions, compared to women with accurate perceptions, and discussion of family planning was not statistically significant.

Of the decision-making variables, women with no say in this domain were less likely to have had a partner reporting a discussion than women who had some or all the say (OR =0.64, 95% CI 0.51-0.81 p≤0.001). As communication or discussion appears to be associated with the key independent variable, decision-making, and the outcome, accuracy, we further tested mediation in the multivariate models.

Multivariate analysis

Table 3.4 shows the results of the adjusted multinomial logistic regression for the relationship between decision-making and perceptions. Although it attenuated slightly in the adjusted model, having no say in husband's earnings remained significantly associated with having unknown perceptions compared to women with accurate perceptions (Adjusted Odds Ratio (AOR)=1.64, 95% CI 1.24-2.17, p≤0.001). Many of the characteristics significantly associated with the outcome in the unadjusted regressions attenuated in the adjusted model. However, several of the variables remained statistically significant. With each additional year of education, women had a decreased odds of having unknown

perceptions (AOR =0.93, 95% CI 0.89-0.96, p≤0.01). Muslim women were significantly more likely to report unknown perceptions compared with Christian women (AOR =1.88 95% CI 1.32-2.65, p≤0.001).

To further evaluate the mediation analysis, we added discussion of family planning to the adjusted multinomial regression model. In the multivariate analysis, the model that included discussion of family planning was not different than model without it in terms of direction, magnitude or significance of the independent variables (see **Table 3.5**). We conclude that, in this sample, discussion of family planning did not mediate the relationship between participation in household decision-making and perceptions of a partner's fertility preferences.

Discussion

In this analysis, we explored women's accuracy in describing their partners' fertility preferences, and what might be associated with having inaccurate or unknown perceptions, among a sample of coupled Ghanaian women from the 2008 DHS survey. Specifically, we looked at five items related to women's participation in household decision-making, and perceptions, as well as the potential for mediation through discussion of family planning, as reported by men.

Main findings

Over 25 percent of women had unknown perceptions of their partner's preferences in the sample, and 20 percent had inaccurate perceptions. We assessed the decision-making items in a variety of ways for this analysis in order to understand how the items together may

reflect decision-making power, and how each separately may perform. Only one decision-making item was significantly related to having unknown perceptions.

Over half of women in the sample had no say in what to do with their partner's earnings. This is not surprising given that men and women in relationships in West Africa historically maintain separate budgets. (Orubuloye, Caldwell, Caldwell, & Bledsoe, 1991) In fact, studies have shown that women in Ghana play a primary economic role in households headed by men (Lloyd & Brandon, 1991), and often have autonomy over their own economic activities and those related to their children. (Bukh, 1979; Tolhurst, Amekudzi, Nyonator, Squire, & Theobald, 2008; Whitehead, Adepoju, Oppong, & others, 1994) That over 90% of women in the sample were working supports the idea that women maintain separate economic autonomy.

Given this, the women that do have a say in their partner's earnings, whether jointly or especially those with sole decision-making authority, are likely different than these women with no say in their husband's earnings. Women with autonomy in this domain may be more likely to be in gender-equitable relationships, where communication about fertility is more common and successful. This is evidenced in our own results, wherein women with no say in partner's earnings have partners who are less likely to report a discussion about family planning (see **Table 3.3**). Another explanation is that women with sole decision-making power over their husband's earnings may be in households with an absent or non-participating partner, which has been suggested by others who have researched household decision-making in developing countries. (Hindin, 2006; Mullany, Hindin, & Becker, 2005)

There are a number of reasons why we may not have seen a relationship between the other decision-making items and our outcome. Although these five questions have been used in the DHS modules for over a decade, they were developed for South Asia and may be of limited value in the Sub-Saharan context. (Kishor & Subaiya, 2008) In fact, difficulty in finding hypothesized relationship using these items in the sub-Saharan context have been noted. (Heckert & Fabic, 2013; Schatz & Williams, 2011) It may be that these items do not accurately represent empowerment in this context.

In relation to our hypothesis that couple communication was in the pathway between household decision-making and accurate perceptions, our data suggest no evidence of mediation. As was previously mentioned, though we use the term "mediation" we are only testing for confounding in this analysis due to the data's cross-sectional nature. There was no change in the decision-making items when discussion was added to the final model. While, in theory, we should have seen attenuation of the decision-making variables and a significant association between accuracy and discussion, our variable was limited. First, although one's fertility preferences are likely to become known during a discussion of family planning, it does not mean that agreement on those preferences is the ultimate outcome. Another reason could be the limitation in the measure itself, specifically that we only had information about couple communication from men. Having the women's perspective on whether family planning was discussed would be more informative as women's reports on contraceptive matters are more accurate. (Becker, Hossain, & Thomson, 2006)

Limitations and strengths

There are a few limitations to this analysis that should be noted. First, with less than a quarter of the sample having inaccurate perceptions, we did not have enough people to conduct further analyses of how women and their partners were inaccurate in those preferences, e.g. to explore differences between women who thought their partners wanted more children when the partners reported they wanted no more children. Lumping all inaccurate women together may have masked associations.

Our measure of women's empowerment—participation in household decision-making—may be a limited measure, as has been noted by others. (Heckert & Fabic, 2013; Kishor & Subaiya, 2008; Schatz & Williams, 2011; Upadhyay & Karasek, 2012)

Our measure of couple communication was limited, as we only had information about discussion of family planning from the men's perspective. Having the women's perspective on whether family planning was discussed would be more informative, as would knowing whether fertility preferences were specifically addressed during these discussions.

This analysis focused solely on the perspectives of women. More in-depth information capturing men's perspectives on women's empowerment could provide more in-depth understanding of how couples communicate about their fertility preferences. Future research and analysis should try to address these factors.

As DHS data is cross-sectional, we do not know the directionality of whether having no say in what to do with husband's earnings "causes" unknown perceptions, or is it that not

knowing a partner's fertility preferences somehow leads to having no participation in a husband's earnings.

Despite the stated limitations, there are a number of strengths in this study. First, it is one of the first studies to consider accuracy in perceptions and empowerment based on a large, nationally representative sample. Additionally, the DHS questions have been vetted extensively over time, and despite limitations, are readily comparable across settings and time. Although we could not run analyses on subgroups of perceptions, these data provide a relatively large sample of respondents.

Conclusion

This analysis was a unique contribution to both the women's empowerment literature and the fertility field. To our knowledge, the relationship between decision-making and perceptions of fertility preferences has not been assessed. Our analysis highlights that a large percentage of women had either inaccurate or unknown perceptions of their partner's fertility preferences. Women who had a say in the decisions around husband's earnings were significantly less likely to have inaccurate perceptions. Further research is warranted to explore the extent to which women's empowerment impacts fertility preferences within couples.

Chapter 3 References

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Table 3.1: Characteristics of coupled women in the 2008 Ghana DHS (n=1759)

Dependent variable	N (%) or mean (SD)
Perceptions of a partner's fertility preferences, n (%)	
Accurate	959 (55.8)
Inaccurate	355 (21.3)
Unknown	445 (22.9)
Key independent variables	
Participation in household decision-making, n (%)	
Husband's Earnings	
Some or all the say	758 (45.8)
No say	1001 (54.2)
Visits to relatives	
Some or all the say	1422 (82.5)
No say	337 (17.5)
Own Health Care	
Some or all the say	1159 (67.7)
No say	600 (32.3)
Major Household Purchases	
Some or all the say	997 (59.8)
No say	762 (40.2)
Daily Household Purchases	
Some or all the say	1344 (77.1)
No say	415 (22.9)
Husband discussed FP in the past few months	
Yes	722 (42.3)
No	1037 (57.7)
Woman's individual-level characteristics	
Age, mean years, range (SD)	32.3, 15-49, (7.8)
Employment, n, (%)	
Working	1599 (90.7)
Not working	160 (9.3)
Education, mean years, range (SD)	5.2, 0-17, (4.6)
Religion, n (%)	
Christian	1172 (70.9)
Muslim	361 (19.1)
Traditional/other	226 (10.0)
Parity, mean, range (SD)	3.0, 0-11, (2.0)
Couple-level characteristics:	
Marital status, n (%)	
Married	1497 (82.6)
Living together	262 (17.4)
Polygamous status, n (%)	
Monogamous	1438 (83.8)
Polygamous	321 (16.2)
Household-level characteristics	
Wealth mean score, (SD)	3.0, 1-5, (1.5)

Residence, n (%)	
Rural	1142 (59.3)
Urban	617 (40.7)

Table 3.2: Unadjusted odds ratios and 95% confidence intervals from multinomial logistic regression analysis showing the association between selected characteristics and perceptions of partner's fertility preferences (n=1759)

	Inaccurate perceptions vs. accurate perceptions (n=355)	Unknown perceptions vs. accurate perceptions (n=445)
	Odds Ratio (95% Confidence Interval)	Odds Ratio (95% Confidence Interval)
Key independent variables		
Women's household decision-making		
No say in husband's earnings	0.88 (0.68-1.14)	1.98 (1.51-2.58)***
No Say in visits to relatives	0.95 (0.69-1.33)	1.16 (0.83-1.63)
No say in own health care	1.05 (0.79-1.37)	0.94 (0.71-1.23)
No say in major household purchases	1.05 (0.79-1.39)	1.03 (0.79-1.35)
No say in daily household purchases	1.01 (0.72-1.42)	1.12 (0.83-1.51)
Discussed FP in last few months	1.19 (0.90-1.58)	0.72 (0.54-0.95)*
Woman's individual characteristics		
Age	1.02 (1.00-1.04)**	0.99 (0.98-1.02)
Working	1.74 (1.00-3.03)	0.94 (0.63-1.44)
Education	1.00 (0.97-1.03)	0.89 (0.85-0.91)***
Religion		
Christian (ref)	1	1
Muslim	0.93 (0.65-1.33)	2.39 (1.71-3.32)***
Traditional/other	1.00 (0.64-1.56)	1.78 (1.06-2.98)*
Parity	1.10 (1.04-1.18)**	1.08 (1.00-1.15)*
Couple-level characteristics		
Marital status		
Married (ref)	1	1
Living together	0.79 (0.55-1.14)	0.74 (0.51-1.06)
Polygamous	1.32 (0.90-1.94)	2.10 (1.44-3.06)***
Household-level characteristics		
Wealth	0.99 (0.90-1.08)	0.74 (0.66-0.81)***
Urban Residence	1.11 (0.85-1.45)	0.52 (0.36-0.71)***

*p≤0.05 level; **p≤0.01 level; ***p≤0.001 level

Table 3.3 Associations between men's reports of discussion of family planning in the last few months and accuracy of women's reports of fertility preferences and household decision-making

Perceptions of fertility preferences	**Odds Ratios (95% Confidence Intervals)**
Accurate perceptions	Ref
Inaccurate perceptions	1.19 (0.90-1.58)
Unknown perceptions	0.71 (0.54-0.95)*
Participation in household decision-making	
No say in how to use husband's earnings	0.64 (0.51-0.81)***
No say in visits to relatives	0.97 (0.72-1.30)
No say in her own health	0.93 (0.74-1.18)
No say in major household purchases	0.81 (0.64-1.01)
No say in daily household purchases	1.01 (0.78-1.30)

*p≤0.05 level; **p≤0.01 level; ***p≤0.001 level

Table 3.4: Adjusted odds ratios and 95% confidence intervals from multinomial logistic regression analysis showing the association between women's participation in household decision-making and perceptions of partner's fertility preferences (n=1759)

	Inaccurate perceptions vs. accurate perceptions (n=355)	Unknown perceptions vs. accurate perceptions (n=445)
	Odds Ratio (95% Confidence Interval)	Odds Ratio (95% Confidence Interval)
Key independent variables		
Women's household decision-making		
No say in husband's earnings	0.84 (0.64-1.10)	1.64 (1.24-2.17)***
No say in visits to relatives	0.99 (0.68-1.43)	1.07 (0.74-1.55)
No say in own health care	1.06 (0.77-1.46)	0.77 (0.56-1.06)
No say in major household purchases	1.07 (0.78-1.48)	0.78 (0.55-1.10)
No say in daily household purchases	1.11 (0.74-1.66)	1.08 (0.73-1.61)
Woman's Individual characteristics		
Age	1.00 (0.98-1.03)	1.00 (0.98-1.02)
Working	1.65 (0.95-2.86)	0.93 (0.56-1.52)
Education	1.01 (0.97-1.05)	0.93 (0.89-0.96)***
Religion		
Christian (ref)	1	1
Muslim	0.88 (0.59-1.32)	1.88 (1.32-2.65)***
Traditional/other	0.89 (0.56-1.45)	1.19 (0.70-2.01)
Parity	1.10 (0.99-1.20)	0.98 (0.90-1.08)
Couple-level characteristics		
Marital status		
Married (ref)	1	1
Living together	0.89 (0.60-1.31)	0.91 (0.62-1.35)
Polygamous	1.34 (0.91-1.99)	1.27 (0.87-1.85)
Household-level characteristics		
Wealth (score)	0.95 (0.82-1.10)	0.95 (0.81-1.12)
Urban residence	1.41 (0.95-2.09)	0.69 (0.45-1.08)

*p≤0.05 level; **p≤0.01 level; ***p≤0.001 level

Table 3.5: Adjusted odds ratios and 95% confidence intervals from multinomial logistic regression analysis showing the association between women's participation in household decision-making and perceptions of partner's fertility preferences, with discussion of family planning added (n=1759)

	Inaccurate perceptions vs. accurate perceptions (n=355)	Unknown perceptions vs. accurate perceptions (n=445)
	Odds Ratio (95% Confidence Interval)	Odds Ratio (95% Confidence Interval)
Key independent variables		
Women's household decision-making		
No say in husband's earnings	0.85 (0.64-1.12)	1.63 (1.24-2.16)***
No say in visits to relatives	0.98 (0.68-1.42)	1.08 (0.74-1.56)
No say in own health care	1.06 (0.77-1.46)	0.77 (0.56-1.06)
No say in major household purchases	1.08 (0.78-1.48)	0.78 (0.55-1.10)
No say in daily household purchases	1.10 (0.73-1.65)	1.08 (0.73-1.62)
Discussed FP in last few months	1.16 (0.86-1.56)	0.93 (0.70-1.23)
Woman's Individual characteristics		
Age	1.00 (0.98-1.03)	1.00 (0.98-1.02)
Working	1.62 (0.94-2.83)	0.94 (0.57-1.54)
Education	1.01 (0.97-1.04)	0.93 (0.89-0.96)***
Religion		
Christian (ref)	1	1
Muslim	0.88 (0.59-1.33)	1.87 (1.32-2.65)***
Traditional/other	0.90 (0.56-1.44)	1.19 (0.71-2.01)
Parity	1.09 (0.99-1.20)	0.98 (0.90-1.07)
Couple-level characteristics		
Marital status		
Married (ref)	1	1
Living together	0.87 (0.59-1.29)	0.92 (0.62-1.36)
Polygamous	1.35 (0.92-1.99)	1.26 (0.87-1.85)
Household-level characteristics		
Wealth (score)	0.94 (0.81-1.10)	0.96 (0.81-1.12)
Urban residence	1.41 (0.95-2.08)	0.69 (0.45-1.08)

*p≤0.05 level; **p≤0.01 level; ***p≤0.001 level

Appendices to Chapter 3

Figure 3.1 Data Flowchart for Analytic Sample (Ghana DHS)

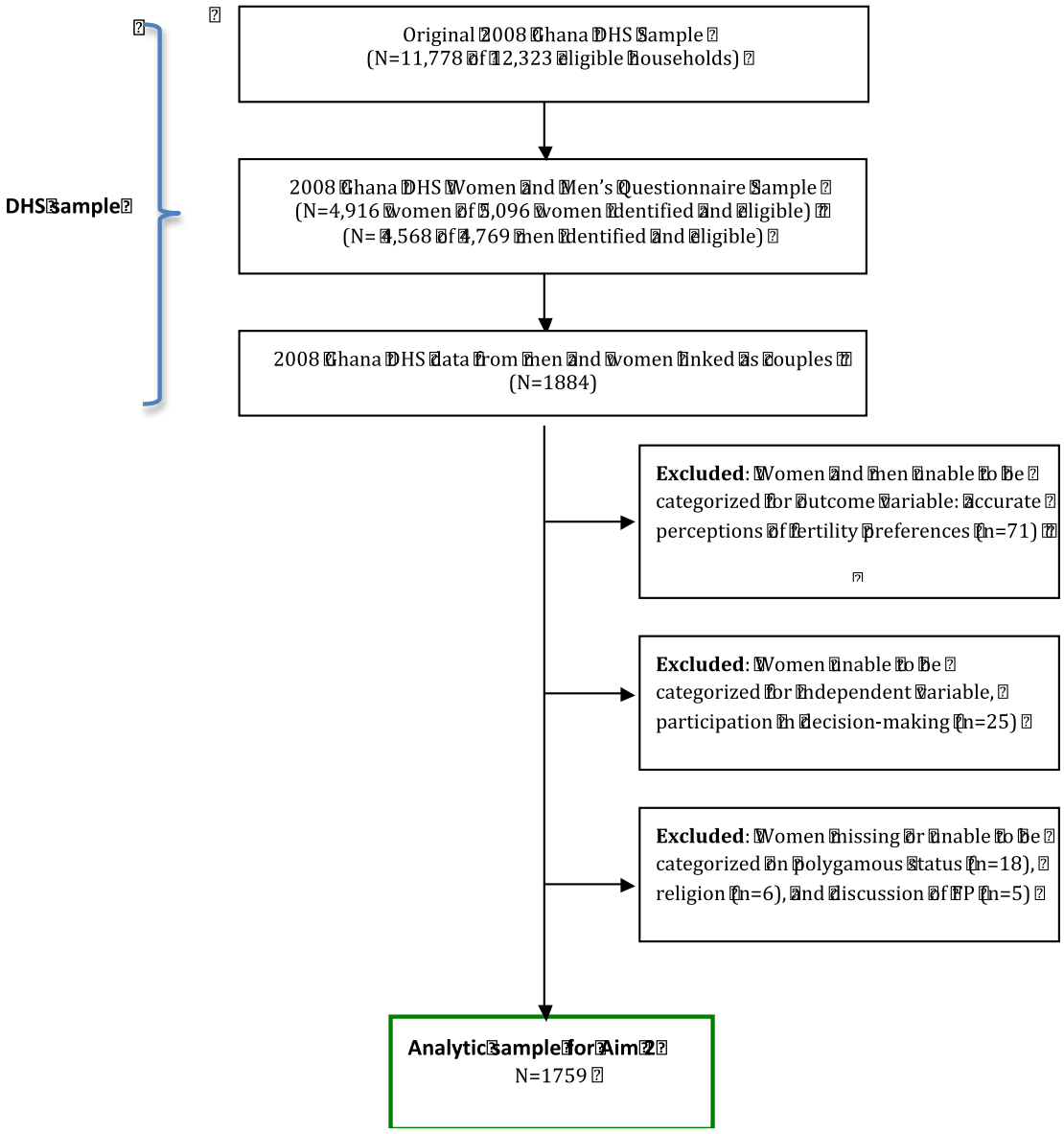

Table A3.1: Women and men's fertility preferences, and women's perceptions of her partner's preferences (n=1884)

Her answer	Her answer	His answer					
She wants more	**What she thinks he wants**	**He wants more**	**He is undecided**	**No more**	**She or he is sterilized**	**She or he infecund**	**No answer/ missing**
	Both want same	472	14	79	2	1	2
	He wants more	146	6	26	2	0	0
	He wants less	49	4	16	0	0	0
	Don't know	250	10	35	0	1	2
	No answer/missing	3	0	0	0	0	0
She is undecided	Both want same	22	0	15	0	0	0
	He wants more	7	0	8	0	0	0
	He wants less	3	0	1	1	0	0
	Don't know	10	2	6	0	0	1
	No answer/missing	0	0	0	0	0	0
She does not want more	Both want same	60	19	250	2	1	0
	He wants more	63	4	49	1	0	0
	He wants less	2	1	36	0	0	1
	Don't know	47	4	83	0	0	0
	No answer/missing	1	0	1	0	0	0
She or he is sterilized*	*Both want same*	0	0	0	0	0	0
	He wants more	0	0	0	0	0	0
	He wants less	0	0	0	0	0	0
	Don't know	0	0	0	0	0	0
	No answer/missing	5	0	25	4	0	0
Infecund	Both want same	5	0	4	0	0	0
	He wants more	1	0	3	0	0	0
	He wants less	2	0	1	1	0	0
	Don't know	2	0	4	0	1	0
	No answer/missing	0	0	0	0	0	0
No answer/missing	Both want same	0	0	0	1	0	0
	He wants more	0	0	0	0	0	0
	He wants less	0	0	0	0	0	0
	Don't know	1	0	1	0	0	0
	No answer/missing	0	0	2	0	0	0

Accurate perceptions

Inaccurate perceptions

Don't know perceptions

Exclude: can't determine preferences

*Was not asked quf5.3estion

CHAPTER FOUR:

MANUSCRIPT THREE

Couple communication and concordance with partners' fertility preferences in Ghana

Introduction

The measure of fertility preferences, which assesses an individual or couple's desire for more children, is commonly used in large-scale fertility surveys like the Demographic and Health Surveys (DHS). (DHS Program, 2015) The measure is important for evaluating population-level fertility trends and family planning programs and policies, as well as for understanding individual-level childbearing and contraceptive patterns. (Debpuur & Bawah, 2002; Morgan & Rackin, 2010; Santelli et al., 2003; Westoff & Ryder, 1977)

How members of a couple communicate their preferences to each other about current or future fertility directly influences contraceptive and fertility outcomes like use of family planning and pregnancy. (Miller, Severy, & Pasta, 2004) In theory, the more the couple communicates, dependent on the quality of that communication, the more the couple is able to make decisions that both members of the dyad desire.

The extent to which couples agree, or are concordant, on fertility and family planning has been frequently studied in the literature. In a key article on couples and reproductive health, Becker—who summarized studies from developing countries reporting on percent of spousal concordance—found a median level of 75% concordance among couples on an preference to have another child. On other fertility preference measures, such as ideal family size, concordance among couples ranged from 59 to 79%. (Becker, 1996) This range has been similarly noted in other data. (Bankole & Westoff, 1998; Takruri et al., 2013) Partner concordance on fertility-related matters like fertility preferences and reported contraceptive method is important, as it has been shown to be associated with contraceptive use. (Bankole & Singh, 1998; Bankole & Westoff, 1998; Harvey, Bird, Henderson, Beckman, & Huszti, 2004; Miller et al., 2004)

With a better understanding of the relation between couples communication and concordance on fertility preferences, we can better understand how women and couples make reproductive decisions related to contraceptive use and childbearing.

Couple communication about reproductive health

Communication about reproductive health within an intimate relationship has long been studied in the reproductive field. Most fertility surveys in Africa collect data on recent discussion about family planning from spouses. In various DHS reports from the 1990s, prevalence of spousal communication in the last year (as reported by women) about family planning ranged from 19% in Niger to 66% in Kenya. (Becker, 1996) Other studies have shown similar ranges. (Salway, 1994; Tumlinson et al., 2013)

A number of demographic characteristics are associated with couple communication, including education, wealth, residence, and religion (Klomegah, 2006), and couple communication about family planning is associated with increased contraceptive use. (Bawah, 2002; Becker, 1996; Beckman, 1983; Hartmann, Gilles, Shattuck, Kerner, & Guest, 2012; Irani, Speizer, & Fotso, 2014; Kimuna & Adamchak, 2001, 2001; Klomegah, 2006; Lasee & Becker, 1997; Link, 2011; Roudi & Ashford, 1996; Salway, 1994; Shattuck et al., 2011; Tumlinson et al., 2013; Yue, O'Donnell, & Sparks, 2010)

Concordance in fertility matters is often the result of couple communication. If communication is successful, members of a couple discuss their individual preferences, and if they disagree, they may attempt to arrive at a mutually agreeable solution. Indeed, a few studies from Africa have shown that couples that discuss family planning are more likely to

be concordant in their reports of contraceptive method than couples who do not communicate (Becker, Hossain, & Thomson, 2006; Ezeh & Mboup, 1997). Other research indicates that disagreement on fertility preferences is more likely due to lack of communication than other reasons such as articulated opposition from one spouse over the other's preferences. (Omondi-Odhiambo, 1997)

Study context

Nationally, data in Ghana suggest a simultaneous decline in fertility combined with a recent decline of contraceptive use. (GSS & Macro, 2009) Among currently married women in Ghana, 36% would like to wait two or more years before their next birth, and the same percentage do not want another child. The desire to space births has declined from 45% to 36% over the last five DHS reports, and the desire to limit increased from 23% to 35% between 1988 and 2008. Ideal family size has decreased over time, from a mean of 5.5 children in 1988 to 4.6 children in 2008. (GSS & Macro, 2009)

In Ghana, spousal communication on family planning has been reportedly low. The percentage of women reporting never speaking to their husbands about family planning ranged from 57.9% in 1988 to 41.3% in 2003. (Ghana Statistical Service, 2004) This question does not appear to be asked in the 2008 DHS survey. (GSS & Macro, 2009)

When it comes to concordance on fertility matters in Ghana, evidence from the 1988 GDHS shows that only 44% of couples were concordant on ideal family size (Salway, 1994), and 17% of couples asked retrospectively about fertility preferences were concordant. In another study, concordance in reporting of fertility-related measures was 79% for having more children and 75% for approving of family planning. (Ezeh, 1993) More often than not,

when discordant, men want more children than women. (Dodoo & Seal, 1994) In a more recent study among peri-urban couples in Kumasi, husband-wife concordance on reports of contraceptive use was extremely low, at 12%, though concordance on fertility preferences was 77.5% (Takruri et al., 2013) (Takruri et al., 2013)

Discordance in contraceptive attitudes and decision-making, as well as perceptions of ideal family size, is reportedly higher in polygamous areas. (Agadjanian & Ezeh, 2000)A few studies have shown that couples' communication on reproductive and fertility matters was associated with subsequent contraceptive uptake. (Avogo & Agadjanian, 2008; Bawah, 2002; Salway, 1994; Tawiah, 1997)

Study aims

Using data from coupled women in the 2008 Ghana DHS, our aim was to understand the association between couple communication and concordance in fertility preferences. We hypothesize that women with a partner reporting a discussion about family planning will be less likely to be discordant with that partner on fertility preferences.

Methods

Data

The study sample for this analysis comes from the 2008 Ghana Demographic and Health Survey (DHS). The Ghana Statistical Services and the Ghana Health Service conducted the data collection. It is the fifth iteration of the survey conducted in Ghana as part of the worldwide DHS program. The primary purpose of the DHS is to collect information related to fertility, marriage, sexual activity, fertility preferences and family planning use, breastfeeding practice, maternal and child health, among other topics.

The 2008 Ghana DHS was conducted on a nationally representative probability sample of 12, 323 households, in ten regions of Ghana across all sectors of wealth and in both urban and rural areas. The DHS relied on a two-stage sample design. In the first stage, 412 clusters were randomly selected (systematic sampling with probability proportionate to size) from a sampling frame, which came from the 2000 Ghanaian national census. As a lead up to the second stage, a household listing process was conducted in 411 clusters (one cluster was removed due to security reasons) to provide the sampling frame. In the second stage, 30 households per cluster were systematically sampled. Weights were calculated in order to consider cluster, household, individual non-response as well as over and under-representation.

Eligible households included residences with women ages 15-49 and men ages 15-59. The Household Questionnaire collected basic information on members of the household, and was used as a screener to find participants for the Women and Men's Questionnaires. Of the 12,323 households eligible for participation, 11,913 were occupied (i.e. non-vacant) during fieldwork. Among the 50 percent of households selected for participation, 5,096 women and 4,769 men were eligible, and 4,916 women and 4,568 men completed the interview. Non-response was mostly due to failure to find individuals at home. (GSS & Macro, 2009)

Analytic sample

Of the 4,916 currently married or cohabitating women aged 15 to 49, the sample for this analysis was first restricted to women whose partners participated in the survey (n=1,884). There were a number of exclusions at this point to get to the final analytic sample. We excluded 38 infecund women, as they were not asked about their own preference. We also excluded five women whose partners did not answer the question about discussion of

family planning. Additionally, we excluded from the analytic dataset the 24 women with missing data on the covariates.

The final analytic sample was 1,817 currently married or cohabitating women aged 15 to 49 (see sample flowchart in **Figure A4.1** in the appendix of this chapter). Though the outcome variable is measured using the women and the men's data, for this analysis, women are considered the unit of analysis.

Measures

Outcome variables

The outcome variable—women's concordance with a partner on fertility preferences — relies on the following DHS question: "Would you like to have (a/another) child, or would you prefer not to have any (more) children?" Answer options were: have (a/another) child, have no more/none, undecided, cannot get pregnant (infecund), or sterilized. This question was asked of both men and women in their respective surveys.

The final outcome variable was based on how women and their partners answered the fertility preferences question. Concordance was constructed as a binary variable: discordant (1) versus concordant (0). Concordant responses included cases where both partners wanted more children, both wanted no more children or both had no firm preferences. All other configurations were considered discordant. Women who were discordant with their partners included women who reported wanting no more children while the partner reported wanting more, or women who had no firm preferences while the partner did not want more children, among other combinations. Sterilized women were treated as women who did not want any more children; therefore a partner who did not

want more children or reported he had a sterilized partner was considered concordant, and a partner who desires more children was categorized as discordant.

Key independent variable

The key independent variable of interest is couple communication. It was based on the only available variable in the couples' dataset on this aspect, asked to men: "In the last few months, have you discussed the practice of family planning with your wife/ cohabiting partner?" This variable was coded as a binary variable, where 1 indicated discussion about family planning with wife/partner in the last few months and 0 indicated no discussion. There were five women whose partners did not answer this question in the dataset, and they were dropped from the analysis.

Other Independent Variables

Variables expected to be related to couple communication or concordance on fertility preferences included women's *individual-level characteristics* (age, religion, parity, education, and employment status); *couple-level characteristics* (relationship duration, marital status, and polygamous status); and *household-level characteristics* (wealth and residence). Due to colinearity with age, relationship duration was removed from the analysis.

Missing data were limited overall. Five women were missing on the continuous education variable, and their number of years of completed education was averaged from the answer to their categorical education response. The 18 women who reported "unsure" or were missing on polygamous status were excluded from the analysis, as were the six missing on religion. Sensitivity bivariate analyses with the outcome were conducted for each of these

variables, in which all excluded were categorized in each category of the variable. For example, all 18 excluded in polygamous were first included as polygamous, then as monogamous, and compared to the variable version without them. Results remained robust regardless of the category these women were included in; therefore, we excluded these 24 women from this analysis.

Analysis

We conducted this analysis in several steps. First, we used bivariate analyses to evaluate and the associations between couple communication, as well as individual, couple and household covariates with the outcome measure, concordance with a partner on fertility preferences. Due to the prevalence of our outcome, we conducted a multivariable modified Poisson model to explore the overall association. (Zou, 2004) In order to understand more about couple communication in the sample, we ran additional unadjusted and adjusted modified Poisson models to assess the relation between covariates and women with partners who report discussion of family planning. We weighted all analyses to consider cluster, household, individual non-response as well as over and under-representation. We conducted all analyses using Stata version 11. (StataCorp, 2009)

Results

Sample characteristics are presented in **Table 4.1**. Women were on average 32.5 years of age. The majority of women in the sample were concordant with their partners on fertility preferences (74.3%). Slightly more than half of women had a partner who reported not having had a discussion about family planning in recent months (57.7%). The majority (90.8%) was employed and had a mean of 5.3 years of school. The majority lived in a rural area (59.4%) and of Christian faith (71.6%). Most respondents were married (82.8%) and

in a monogamous relationship (84.2%). Average parity in the sample was 3.1 children.

Bivariate analysis

Table 4.2 shows the results from the unadjusted modified Poisson regressions of sample characteristics and the outcome, being discordant with a partner on fertility preferences. The was no relation between men's reports of a discussion about family planning and women's concordance with their partners on fertility preferences. Several other covariates were significantly associated with being discordant. The risk of being discordant increased with age (Relative Risk, RR 1.02, 95% CI 1.01-1.03, p≤0.01) and parity (RR 1.12, 95% CI 1.08-1.16, p≤0.001), though the risk was reduced with increasing years of completed education (RR 0.98, 95% CI 0.96-1.00, p≤0.05). Women in polygamous relationships were also at an increased risk of being discordant (RR 1.45 95% CI 1.18-1.77, p≤0.001).

Multivariate analysis

Table 4.2 also shows the results of the fully adjusted modified Poisson regression for the relationship between discussion of family planning and discordance in fertility preference. Despite adjustment, having had a partner reporting previous discussion of family planning remained non-significant in the adjusted model. Women of higher parity were still at an increased risk of being discordant (Adjusted Relative Risk, ARR 1.12, 95% CI 1.06-1.19, p≤0.001). The risk of being discordant for women in polygamous relationship slightly attenuated but remained statistically significant (ARR 1.37, 95% CI 1.10-1.70, p≤0.01). Age and education were no longer statistically significantly related to the outcome in the adjusted models.

Factors associated with discussion of family planning

In order to better understand the types of men that reported communicating with their partners, we examined the factors associated with his report of communicating about family planning in the past few months. **Table 4.3** shows the results of the unadjusted and fully adjusted modified Poisson regression for the relationship between various sample characteristics and men's reports of a family planning discussion. In the unadjusted models, increasing years of education were associated with having had a male partner reporting a recent discussion about family planning (RR 1.04, 95% CI 1.02-1.05, p≤0.001). Women who were living with their partners but unmarried (compared to married women), as well as woman from urban environments as compared to rural, were much more likely to have a partner reporting a discussion about family planning (RR 1.31, 95% CI 1.13-1.52, p≤0.001 and RR 1.22, 95% CI 1.01-1.40, p≤0.01, respectively). On the other hand, Muslim women and women in polygamous unions were much less likely to have a partner reporting a discussion (RR 0.74, 95% CI (0.60-0.91), p≤0.01 and RR 0.76, 95% 0.61-0.94, p≤0.05, respectively).

In the fully adjusted model, many of the associations seen in the unadjusted became non-significant with the exception of women in unmarried unions, which remained associated with discussion (ARR 1.31, 95% CI 1.12-1.52, p≤0.001). There was a decrease in the likelihood of a reported discussion with increases in age (ARR 0.99, 95% CI 0.97-0.99, p≤0.05), and an increase in the likelihood for discussion for women of higher parity and wealth (RR 1.12, 95% CI 1.07-1.16, p≤0.001 and RR 1.08, 95% CI 1.12-1.52, p≤0.05, respectively).

Discussion

In this analysis, we explored concordance in fertility preferences—and what might be associated with being discordant—among a sample of coupled Ghanaian women from the 2008 DHS survey. Specifically, we looked at whether not having discussed family planning with a partner was associated with a woman who is discordant with a partner on fertility preferences.

Main findings

Approximately 75 percent of women were concordant with their partner on fertility preferences in the sample. This is slightly higher than what has previously been found in the African context (Becker, 1996) and in Ghana in particular, although these studies are from the late 1980s and early 1990s. (Ezeh, 1993; Salway, 1994) One recent study found 77.5% concordance on fertility preferences among couples in peri-urban Accra, Ghana. (Takruri et al., 2013)

Our hypothesis was that not having had a discussion about family planning would be related to being discordant with a partner on fertility preferences. Our results do not support this hypothesis. One reason for a lack of association could be that, although one's fertility preferences are likely to become known during a discussion of family planning, it does not mean that agreement on those preferences is the ultimate outcome. Another reason could be the limitation in the measure itself, specifically that we only had information about couple communication from men. Having the women's perspective on whether family planning was discussed would be more informative as women's reports on contraceptive matters are more accurate (Becker et al., 2006) and in surveys, women report

less communication about family planning than do men. (Salway, 1994; Tumlinson et al., 2013)

We conducted additional analyses to understand more about the types of women in partnerships with men that report a discussion about family planning. We found that, as women got older, they were much less likely to have a partner reporting a recent discussion about family planning. This may because there is less perceived need to discuss the issue among older couples, particularly if they are approaching the end of their reproductive life span. Also, as age and relationship duration are confounded, it may be that longer-standing couples have discussed family planning in the past, but not recently. Conversely, there was a greater chance of discussion for women with increasing parity and wealth. That increasing parity was associated with a discussion does not negate this finding and may be indicated of women who want to cease childbearing but whose partner does not. (Becker, 1996) Little research exists on correlates of men's communication, and further exploration on this topic is warranted.

Other findings

Parity was positively correlated with being discordant with a partner in preferences. This could be explained by women that have completed their desired fertility but have partners that have not completed theirs. In a review by Becker, 12 of 17 studies—mostly from Africa and Asia—found that when there was disagreement on desire for more children, men were more likely than women to want more children. (Becker, 1996) However, one study from Nigeria found that husband's preference was more important only in smaller families. (Bankole, 1995)

Our data showed that women in polygamous relationships were more likely to be discordant with their partners on fertility preferences. This corroborates other studies in Africa that have similarly concluded women in polygamous unions—as compared to their monogamous counterparts—have poorer spousal communication and disagree with partners more about fertility aspects such as future childbearing and contraceptive use. (Izugbara, Ibisomi, Ezeh, & Mandara, 2010) Polygamous women are likely different on many accounts than monogamous women (Baschieri et al., 2013) and are less likely to be in gender equitable relationships. (Agadjanian & Ezeh, 2000; Izugbara et al., 2010)

Interestingly, our results showed that unmarried women who are living with their partners were much more likely to have a partner reporting a discussion, compared to married women. Qualitative research in Ghana has suggested that unmarried men are concerned about being trapped by an unwanted pregnancy. (Schwandt et al., 2013) It may be that fears of unwanted pregnancies outside of marriage facilitate more frequent discussions about family planning. Further research could investigate reproductive health among unmarried couples in stable relationships in Ghana.

Limitations and strengths

With only a quarter of women in the sample being discordant with a partner on preferences, we did not have enough people to further investigate categories of discordance, e.g. women who said they did not want more children but whose partner said they wanted more. Lumping all discordant women together may have masked associations, and we know that certain types of discordance impact reproductive outcomes. Most research from Africa shows that when there was disagreement within a couple on fertility

preferences, often one partner is left with an unmet need for family planning. (Bankole, 1995; Becker, 1996; Short & Kiros, 2002)

As has already been mentioned, our measure of couple communication was limited, as we only had information about discussion of family planning from the men's perspective. Having the women's perspective on whether family planning was discussed would be more informative, as would knowing whether fertility preferences were specifically addressed during these discussions.

This analysis focused solely on the perspectives of women. More in-depth information capturing men's perspectives could provide more in-depth understanding of how couples communicate about their fertility preferences. Future research and analysis should try to address these factors.

As DHS data is cross-sectional, and we therefore cannot establish causality in our findings.

Despite the stated limitations, there are a number of strengths in this study. This is one of the first studies to look at the association between discussion of family planning and concordance in fertility preferences among couples in the 2008 Ghana DHS. We were able to adjusted for many of the variables theoretically associated with both of these concepts. In addition, this is one of the first studies to look at the correlates of men's reports of communicating about family planning in the last few months—a key variable in many analyses that look at contraceptive uptake.

Conclusion

This analysis was a unique contribution to the fertility field. The relationship between couple communication and concordance in reproductive aspects has been studied, but to our knowledge this is the first time that concordance in fertility preferences has been assessed among coupled women in the 2008 Ghana DHS. Ghana is a particularly interesting context for this analysis, as modern contraceptive use has declined between recent DHS survey rounds, and unmet need remains high. It is important to understand how couple communication may be related to concordance among couples in their fertility preferences, as this ultimately will impact couple fertility and contraceptive use.

Chapter 4 References

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Table 4.1: Selected characteristics of coupled women in the 2008 Ghana DHS (n=1817)

Dependent Variable	**n (%) or mean (SD)**
Concordant on fertility preferences, n (%)	
Concordant	1350 (74.3)
Discordant	467 (25.7)
Key independent variable:	
Discussed family planning with wife/partner in last few months, n (%)	
No	1069 (57.7)
Yes	748 (42.3)
Woman's Individual-level characteristics	
Age, mean years, range (SD)	32.5, 15-49, (7.8)
Employment, n (%)	
Working	1654 (90.8)
Not working	163 (9.2)
Education, mean years, range (SD)	5.3, 0-17, (4.6)
Religion, n (%)	
Christian	1224 (71.6)
Muslim	359 (18.4)
Traditional/other	234 (10.0)
Parity, mean, range (SD)	3.1, 0-11, (2.0)
Couple-level characteristics:	
Marital status, n (%)	
Married	1546 (82.8)
Living together	271 (17.2)
Polygamous status, n (%)	
Monogamous	1492 (84.2)
Polygamous	325 (15.8)
Household-level characteristics	
Wealth, mean (SD)	3.0 (1.5)
Residence, n (%)	
Rural	1178 (59.4)
Urban	639 (40.6)

Table 4.2: Unadjusted and adjusted relative risk and 95% confidence intervals from modified Poisson regression analysis showing the association between selected characteristics and concordance in fertility preferences (n=1817)

Key independent variable:	Unadjusted relative risk of discordance	Adjusted relative risk of discordance
Discussed family planning with wife/partner in last few months, n (%)		
No	Ref	Ref
Yes	1.01 (0.83-1.22)	1.00 (0.83-1.22)
Woman's individual-level characteristics		
Age	1.02 (1.01-1.03)**	1.00 (0.98-1.01)
Employment		
Working	Ref	Ref
Not working	1.00 (0.75-1.35)	0.89 (0.66-1.21)
Education	0.98 (0.96-1.00)*	0.99 (0.97-1.02)
Religion		
Christian	Ref	Ref
Muslim	1.00 (0.82-1.22)	0.91 (0.71-1.15)
Traditional/other	1.27 (0.98-1.66)	1.04 (0.77-1.39)
Parity	1.12 (1.08-1.16)***	1.12 (1.06-1.19)***
Couple-level characteristics:		
Marital status		
Married	Ref	Ref
Living together	0.99 (0.79-1.24)	1.11 (0.87-1.40)
Polygamous status		
Monogamous	Ref	Ref
Polygamous	1.45 (1.18-1.77)***	1.37 (1.10-1.70)**
Household-level characteristics		
Wealth	0.95 (0.90-1.01)	0.99 (0.90-1.09)
Residence		
Rural	Ref	Ref
Urban	0.95 (0.79-1.15)	1.18 (0.91-1.54)

*p≤0.05 level; **p≤0.01 level; ***p≤0.001 level

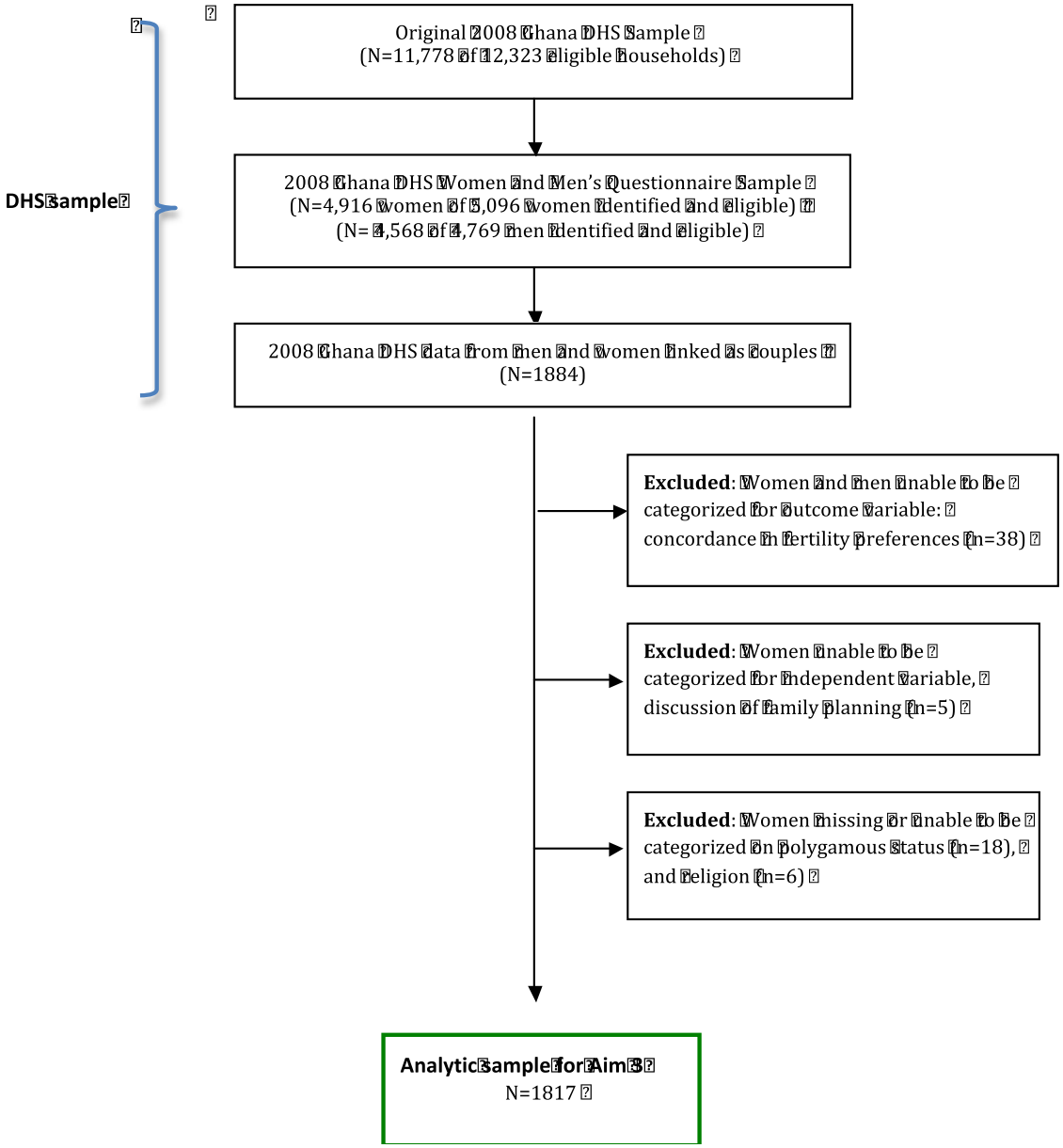
Table 4.3: Unadjusted and Adjusted relative risk and 95% confidence intervals from modified Poisson regression analysis showing the association between selected characteristics and discussion of family planning (n=1817)

	Unadjusted relative risk (95% CI) of family planning discussion	Adjusted relative risk (95% CI) of family planning discussion
Woman's individual-level characteristics		
Age	1.00 (0.99-1.01)	0.99 (0.97-0.99)**
Employment		
Working	Ref	Ref
Not working	1.17 (0.91-1.49)	1.20 (0.96-1.51)
Education	1.04 (1.02-1.05)***	1.03 (1.01-1.16)
Religion		
Christian	Ref	Ref
Muslim	0.74 (0.60-0.91)**	0.88 (0.72-1.07)
Traditional/other	0.85 (0.68-1.06)	0.97 (0.78-1.20)
Parity	1.02 (01.00-1.05)	1.12 (1.07-1.16)***
Couple-level characteristics:		
Marital status		
Married	Ref	Ref
Living together	1.31 (1.13-1.52)***	1.31 (1.12-1.52)***
Polygamous status		
Monogamous	Ref	Ref
Polygamous	0.76 (0.61-0.94)*	0.89 (0.73-1.09)
Household-level characteristics		
Wealth	1.11 (1.06-1.16)	1.08 (1.12-1.52)*
Residence		
Rural	Ref	Ref
Urban	1.22 (1.01.40)**	1.04 (0.87-1.26)

*p≤0.05; **p≤0.01; ***p≤0.001

Appendix to Chapter 4

Figure A4.1: Data Flowchart for Analytic Sample (Ghana DHS)



CHAPTER FIVE:

CONCLUSION

In this dissertation, I sought to gain additional insight into the construct of fertility preferences within the relationship context. Specifically, this dissertation assessed the stability of fertility preferences over time, as well as how accurate and concordant woman were with their partners' preferences. I used quantitative measures to evaluate the construct in two samples of women in Ghana.

In this concluding chapter, I provide an overview of the findings of each dissertation aim, a discussion of the limitations and strengths, the public health and research implications, and a brief conclusion of the overall dissertation.

Overview of Aim 1 (Chapter 2)

In Chapter 2, I assessed how fertility preferences change over time, and how relationship quality may be associated with a change in preferences. This study was motivated by the idea that if preferences shift over time, so too will women's need to plan and space their children. Life events have been shown to be associated with a change in preferences over time (Bankole & Westoff, 1998; Kodzi, Casterline, & Aglobitse, 2010; Sennott & Yeatman, 2012; Yeatman, Sennott, & Culpepper, 2013), but no one has assessed how aspects of relationship quality may be related to shifting preferences.

Using data from the Family Health and Wealth Study (FHWS), I performed bivariate and multivariate logistic regression to investigate how four relationship quality scales that had previously been validated in developed-world settings were related to a change in preferences, adjusting for other covariates and study sites.

Results indicated that approximately 30% of women changed their preferences between

FHWS rounds. Bivariate analyses revealed that increases in the Destructive Communication scale, which indicated positive relationship quality, were associated with decreased odds in the reporting of a change in preferences between rounds (Odds Ratio (OR)=0.97, 95% CI 0.95-0.99, $p \leq 0.05$). None of the other relationship quality scales predicted a change in preferences. In the multivariate logistic regression, none of the scales were associated with the outcome, and additional multivariate logistic regressions to understand the independent effects of each scale did not provide additional insight into the relationship between quality and a change in preferences in the fully adjusted model. Age wealth, education, and the birth of a child between rounds—were associated with changes in preferences, although many covariates that theoretically associated with a change were not significant.

There is little, if any, literature available on how relationship quality impacts fertility preferences and little understanding about relationship quality generally in the African context to help explain these results. It is possible that the lack of findings between the independent and dependent variables was related to the limitation in the dependent variable; specifically, that we could not analyze the type of change in fertility preferences over time. With only approximately a quarter of the sample reporting different fertility preferences in the two rounds, we did not have enough people in each category to conduct a detailed analysis of all the potential categories of change. We were unable to assess different types of change, e.g. changing from not wanting more children to wanting more children, and it is unlikely that these different types of change hold the same meaning. This limitation may explain why we did not see a relationship between our independent variable and our outcome, nor for expected associations such as parity or other age categories.

Other explanations may be that relationship quality, as captured by these scales, does not reflect what quality means to Ghanaians. Other studies have shown that concepts like affection, support, patience, and understanding—concepts not measured in these scales—resonate more in Ghana in terms of relationship quality. (Bull, Duah-Owusu, & Autry Andvik, 2010; Cox, Hindin, Otupiri, & Larsen-Reindorf, 2013; N. B. Miller & Kannae, 1999; Muntifering, 2012)

This analysis highlights that fertility preferences in the FHWS peri-urban sample reflect what may be frequent changes in the preferences of couples. For some women—especially those whose changing preferences do not align with their lifetime fertility goals—this frequent shifting may result in low or inconsistent use of contraception that observed in Ghana. Women who change preferences may be more like to use temporary or less effective methods of pregnancy prevention, or resort to abortion to have their actual fertility match their preferences. Additional research should explore whether the changes in preferences reflect true fluctuations in preferences, or short-term contextual and partnership factors, as well as the impact of preferences on contraceptive behavior and relationship stability. Additional work could also explore relationship quality in greater depth.

Overview of Aim 2 (Chapter 3)

In Chapter 3 I assessed how women's empowerment related to accurate perceptions in a partner's fertility preferences among women in the 2008 Ghana Demographic and Health Survey (DHS). There are limited studies in Africa that have assessed the accuracy of perceptions of partner's fertility preferences. If we know that contraceptive and fertility behaviors are often guided by what women think their partners want, especially in contexts where gender norms influence women to be deferential to their partners, or afford them

lower autonomy and negotiation power in their relationships, than knowing about accuracy of women's perceptions can influence how women and couples can make reproductive decisions that are both desirable and desired.

A key aspect related to couple communication about fertility-related matters is how empowered women are in their relationship to speak about their reproductive intentions and desires. I used woman's participation in household decision-making as a proxy for women's empowerment and hypothesized that women who were more "empowered" would be more likely to have accurate perceptions. I used unadjusted and adjusted multinomial logistic regressions to understand this relationship. I also tested if couple communication—as measured by men's report of a discussion about family planning with his partner—was a mediator in this relationship.

Results indicated that 55.8% of women in the sample had accurate perceptions, 21.3% had inaccurate perceptions, and 22.9% had unknown perceptions of their partners fertility preferences. In the fully adjusted models, women who had no say in husband's earnings remained significantly associated with having unknown perceptions (Adjusted relative risk ratio (ARRR)=1.64, 95% CI 1.24-2.17, $p \leq 0.001$) compared to women with accurate perceptions. Given the fact that maintaining separate budgets is normative in Western Africa, and 90% of women in the sample were working, the women that do have a say in their partner's earnings, whether jointly or especially those with sole decision-making authority, are likely different than these women with no say in their husband's earnings. These women may be more likely to be in gender-equitable relationships, or in households with an absent or non-participating partner, which has been suggested by others who have

researched household decision-making in developing countries. (Hindin, 2006; Mullany, Hindin, & Becker, 2005)

None of the other household decision-making items were associated with accuracy of perceptions. The use of the DHS variables around women's participation in household decision-making have yielded perplexing results, and many have concluded that they may not be relevant or applicable in the African context. (Heckert & Fabic, 2013; Schatz & Williams, 2011) Our limited variable related to couple communication may explain why we did not see that couple communication was in the pathway between decision-making and accurate perceptions.

Despite the fact that having no say in husband's earnings was significantly associated with discussion of family planning, and discussion of family planning was associated with accuracy, in the multivariate analysis, the model that included discussion of family planning was not different than the model without it in terms of direction, magnitude or significance of the independent variables. Therefore, mediation was not found.

This analysis highlights that a large percentage of women had either inaccurate or unknown perceptions of their partner's fertility preferences. Women who had a say in the decisions around husband's earnings were significantly less likely to have inaccurate perceptions. Further research is warranted to explore the extent to which women's empowerment impacts fertility preferences within couples.

Overview of Aim 3 (Chapter 4)

In Chapter 4 I assessed how couple communication relates to women's concordance with their partners fertility preferences among women in the 2008 Ghana DHS. Partner

concordance on fertility-related matters like fertility preferences and reported contraceptive method is important, as it has been shown to be associated with contraceptive use. (Bankole & Singh, 1998; Bankole & Westoff, 1998; Harvey, Bird, Henderson, Beckman, & Huszti, 2004; W. Miller, Severy, & Pasta, 2004) Indeed, a few studies from Africa have shown that couples that discuss family planning are more likely to be concordant in their reports of contraceptive method than couples who do not communicate (Becker, Hossain, & Thomson, 2006; Ezeh & Mboup, 1997). Other research indicates that disagreement on fertility preferences is more likely due to lack of communication than articulated opposition. (Greene & Biddlecom, 2000)

Using unadjusted and adjusted modified Poisson models, I examined how men's report of a discussion about family planning with a partner was associated with woman's concordance with their partner about fertility preferences. Results showed that approximately 75 percent of women were concordant with their partner on fertility preferences in the sample.

In both the unadjusted and adjusted models, discussion of family planning was not significantly related to concordance. One main explanation for not finding a significant association is the insufficient measure of couple communication, which was only available from men's perspectives. Having the women's perspective on whether family planning was discussed would be more informative as women's reports on contraceptive matters are more accurate (Becker et al., 2006) and in surveys, women report less communication about family planning than do men. (Salway, 1994; Tumlinson et al., 2013)

Women of higher parity and polygamous women were more likely to be discordant (ARR 1.12, 95% CI 1.06-1.19, p≤0.001 and ARR 1.37, 95% CI 1.10-1.70, p≤0.01, respectively).

To understand the types of men that reported communicating with their partners, this chapter examines factors associated with men's report using unadjusted and adjusted Poisson models. In the adjusted models, women in unmarried unions, was significantly related to a male partner's report of a discussion (ARR 1.31, 95% CI 1.12-1.52, p≤0.001). Qualitative research in Ghana has suggested that unmarried men are concerned about being trapped by an unwanted pregnancy. (Schwandt et al., 2013) It may be that fears of unwanted pregnancies outside of marriage facilitate more frequent discussions about family planning. Further research could investigate reproductive health among unmarried couples in stable relationships in Ghana.

The relationship between couple communication and concordance in reproductive aspects has been studied, but to our knowledge this is the first time that concordance in fertility preferences has been assessed among coupled women in the 2008 Ghana DHS. Ghana is a particularly interesting context for this analysis, as modern contraceptive use has declined between recent DHS survey rounds, and unmet need remains high. It is important to understand how couple communication may be related to concordance among couples in their fertility preferences, as this ultimately will impact couple fertility and contraceptive use.

Overall conclusion of the dissertation

One of the primary goals of this dissertation was to provide further understanding of the fertility preferences measure, especially within the relationship context. Several important conclusions for future research and practice can be drawn from the findings presented in

this dissertation that relate to this goal.

Implications for future research

That a notable percentage of women changed fertility preferences over time in this Ghanaian sample contributes to a growing body of evidence from Africa with similar conclusions. (Kodzi et al., 2010; Sennott & Yeatman, 2012) Although this dissertation did not find that relationship quality was associated with women's change in fertility preferences over time in the FHWS sample, further research could investigate how other aspects of relationship quality are related to changes in preferences over time.

While there have been an increasing number of recent studies on relationship quality in Ghana (Abane, 2003; Cox et al., 2013; N. B. Miller & Kannae, 1999), we still do not fully understand the association between quality and other reproductive health outcomes. Assessing the psychometric properties of these scales in this sample is a good first step, but more research should validate these scales in similar settings, or even among a different Ghanaian sample, to build the evidence base on the applicability of these scales in developing countries A few studies in Ghana suggest that other aspects like understanding resonate with individuals in terms of their marital quality. (Cox et al., 2013, Miller et al, 1999). Further research, especially qualitative research building on Cox et al's work (Cox et al., 2013), could go more in-depth into what aspects of quality are important to Ghanaian couples across the reproductive life span.

I looked at how couple communication related to both accuracy of and concordance with a partner on fertility preferences. Theoretically, these two outcomes would be related: more frequent and successful communication about preferences between members of a couple would result in each partner knowing the other's preference, and a greater chance

discordant preferences align. However, the results of this study do not support this conclusion. Reasons for the lack of association are explained elsewhere in this chapter, but new research could work to further understand the constructs here. Qualitative research could tease out aspects of communication such as frequency, depth of discussion on preferences, and communication styles, and quantitative research could link some of those specific aspects to perceptions and concordance. Research should involve both men and women's perceptions of and experience with communicating with a partner about fertility preferences and family planning.

The use of the household decision-making items from the DHS contributes to a substantial literature on women's empowerment in Africa.(Do & Kurimoto, 2012; Hindin, 2000, 2005, 2006; Kishor & Subaiya, 2008; Upadhyay & Karasek, 2012) The findings on these items from this dissertation add to other mixed and unexpected findings that have been noted by others. (Hindin, 2000; Upadhyay & Karasek, 2012) Further research should continue to understand the importance and relevance (or lack thereof) of these items in Africa, as some have started to do. (Heckert & Fabic, 2013)

Lastly, two groups of women stood out in these findings: Muslim women, and women in polygamous relationships. Research on these two groups of women suggest that they are often disadvantaged in their reproductive health, as compared to women of other religious and marital backgrounds. (Agadjanian & Ezeh, 2000; Gyimah, Takyi, & Addai, 2006; Takyi & Nii-Amoo Dodoo, 2005) Additional research should continue to explore fertility preferences among these groups of women, especially as it relates to their access to and use of family planning.

Public Health implications

Providers in this context can expect that a notable percentage of their clientele will likely change their fertility preferences over time. When women's fertility preferences change, their contraceptive needs will likely change as well. In fact, women's preferences will likely change throughout their reproductive lifecourse; however, some may change in unexpected ways, and over shorter periods of time, so it is important for providers, programs and policies to support a broad mix of contraceptive methods in order to meet women's needs and preferences, including methods for both spacing and limiting.

The fact that many women were found to have inaccurate or unknown perceptions of their partner's fertility preferences, or to be discordant with a partner on preferences, has implications for practice. However, the implication is not a simple as suggesting couples communicate more about reproductive health. There is a delicate balance between promoting couple communication and ensuring women's rights to have a say over the number and timing of their children. First, not all communication between couples is positive for women. In fact, qualitative data from Uganda found that women are more likely to perceive disagreement than men about reproductive issues after communication. (Blanc et al., 1996) Difficult spousal communication has been associated with covert use of contraception (Biddlecom & Fapohunda, 1998) Although couple communication is a frequent programmatic recommendation, it may not universally be in the best way to support women to have the children they want to have, when they want to have them. (Greene & Biddlecom, 2000)

Limitations and strengths

There are limitations to this dissertation that should be noted. Perhaps the greatest limitation was in the challenging nature of some of the primary constructs of interest in this dissertation. For all three outcomes, small cell sizes limited the ability to gather more detailed information that may have had meaningful implications for the results. In terms of changes in fertility preferences over time in the FHWS sample, it would have been helpful to know about differences between those women who changed from wanting more children to wanting fewer in terms of their relationship quality. There are likely differences between women who perceived their partner to want more children when the partner did not want more. Women discordant with their partner's because they wanted more and their partners didn't may be different than women who do not want more children, but their partners do. Being unable to assess such distinctions for these outcomes is likely related to why we do not see many significant associations.

The DHS questions around participation in household decision-making as a representation for women's empowerment may be a stretch. Although these five questions have been used in the DHS modules for over a decade, they were developed for the South Asia and may be of limited value in the Sub-Saharan context. (Kishor & Subaiya, 2008) In fact, difficulty in finding hypothesized relationship using these items in the sub-Saharan context have been noted. (Heckert & Fabic, 2013; Schatz & Williams, 2011) It may be that these items do not accurately represent empowerment in this context.

The measure of couple communication used in Aims 2 and 3 was limited, as only information about discussion of family planning was available from men's perspective. Having the women's perspective on whether family planning was discussed would be more

informative, as would knowing whether fertility preferences were specifically addressed during these discussions.

All three analyses in this dissertation were secondary, which limited variable choice to what was collected by the study team. Specific to Aim 1, there were key variable of interest—such as contraceptive use, and pregnancy status in Round 1—that were missing on unable to be verified for use in this analysis. However, most of the key variables related to fertility and relationship characteristics were available, and having two time points to measure change in preferences is a key strength of this data source.

There were a number of strengths to this dissertation. First, having two rounds of data in the FHWS sample allowed for measurement of the change in fertility preferences over time. Adjusting for a number of important covariates theoretically related to a change in preferences, such as birth of a child between rounds, was possible. In addition, the DHS data allow for a large nationally representative analysis. Lastly, investigating the question of relationship quality related to a change in preferences over time was a new contribution to the field.

Conclusion

Fertility preferences are a dynamic construct with a long history of measurement and exploration. This dissertation examined preferences in the context of the relationship, especially related to the quality of that relationship and extent of communication. With a better understanding of individual and couples' preferences for more children (or not), we can better serve their reproductive needs and desires.

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Appendix to Chapter 5: Curriculum Vitae

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EDUCATION

Johns Hopkins Bloomberg School of Public Health (JHSPH) *(Fall 2015)*

- PhD in the Department of Population, Family and Reproductive Health
- Concentration in Reproductive, Perinatal and Women's Health; and Epidemiology
- Certificate in Population and Health
- Advisor: Dr. Michelle Hindin
-

School of Global Public Health, University of North Carolina at Chapel Hill (UNCCH) *(May 2008)*

- Masters of Public Health in Health Behavior and Health Education (HBHE)
- Certificate in Global Health
- Master's paper: "Planning for sustainability: the Honduran Health Alliance"
- Advisor: Dr. Allen Steckler
-

University of North Carolina at Chapel Hill (May 2004)

- Bachelor of Arts in International Studies with a Minor in Spanish
- Study abroad in Ecuador at the Universidad San Francisco de Quito (Summer 2003)

RESEARCH EXPERIENCE

Social and Behavioral Scientist, International Center for Research on Women (September 2013-current)

- Serve as the Monitoring and Evaluation Specialist for the USAID-funded project YouthPower Learning.
- Served as co-principal investigator for USAID-funded Expanding Effective Contraceptive Options (EECO) in Zambia
    - Coordinated research activities for EECO, including:
        - Designed the formative qualitative research in Zambia and Malawi
        - Wrote and submitted the formative research protocol and consent forms for ethical review
        - Designed and piloted interview guides for men, women and providers
        - Conducted training and oversaw data collection in Zambia
        - Drafted literature review for EECO on five female-controlled contraceptive methods
- Reviewed and developed protocols and indicators for research teams related to gender and family planning for the USAID-funded FACT project with the Institute for Reproductive Health at Georgetown University.

- Coordinated research activities for a World Bank-funded study on access to sexual and reproductive health for adolescent girls living in Dhaka slums
    - Worked with the team to develop the mixed methods study design data collection instruments
    - Facilitated submission of pertinent documentation to the ethics review boards
    - Co-facilitated the study training with the team in Bangladesh
    - Lead the qualitative analysis and coordinate quantitative analysis
    - Co-wrote final report
- Participated in proposal writing, including concept notes and full proposals, for various donors

Graduate Research Assistant, Department of Population, Family and Reproductive Health (March 2011-September 2013)

- Worked with the Gates Institute for Reproductive Health; Advance Family Planning; and the Center for Communication Programs on various research tasks including:
    - Conducted a systematic literature review on community-based distribution of family planning
    - Analyzed interviews with stakeholders about international family planning efforts
    - Completed a content analysis of the US government's prioritization of the international family planning agenda
    - Analyzed data and prepared manuscript on condom use in South Africa
    - Conducted literature review on various health topics in Malawi

Global Health Research Fellow, *FHI360, Research Triangle Park NC* (July 2008-July 2010)

- Served as the principal investigator on a qualitative research with couples about family planning decision-making and communication (Department of Choluteca, Honduras)
    - Designed study, data collection instruments, informed consent forms, and training materials; wrote protocol, and obtained ethical approval from FHI360 and Honduran Ministry of Health
    - Conducted study-specific training in Spanish with data collectors and a study coordinator in
    - Analyzed data and drafted report and manuscript
- Worked with principal investigators to design:
    - A study on men's role in their partner's use of emergency contraception in Accra, Ghana (mixed methods)
    - A randomized study to test if an alcohol harm-reduction intervention will influence hazardous and harmful alcohol use among female sex workers in Mombasa, Kenya (quantitative)
    - A randomized trial looking at financial incentives and technologies for HAART adherence in North Carolina (mixed methods)
- Developed instruments for studies on:
    - Men's role in their partner's use of emergency contraception in Ghana (quantitative and qualitative)
    - Community perceptions of malaria and vaccines in Burkina Faso and Mozambique (qualitative)

    - The acceptability and performance of a device for vaginal drug delivery in South Africa (qualitative)
- Coded, analyzed and worked on manuscripts using qualitative data from studies on:
    - Community perceptions of malaria and vaccines (Burkina Faso)
    - Men's role in their partner's use of emergency contraception (Ghana)
    - Formative research to develop approaches and recommendations for obtaining assent and disclosing HIV status to children in Lilongwe, Malawi
    - Bridging from emergency contraception to ongoing contraceptive use in Ghanaian pharmacies
- Designed and conducted components of the following research trainings:
    - Study-specific training for "Community perceptions of malaria and vaccines," (Burkina Faso and Mozambique)
    - Qualitative methods and study-specific instrument training for research staff collecting data on men's role in their partner's use of emergency contraception (Ghana)
    - Study-specific training for HPTN 064, a women's sero-incidence study (New York City)
    - Increasing recruitment and retention in the clinical trial HPTN 052 for HIV-discordant couples (Thailand)
- Completed a monitoring visit for a malaria study (Mozambique) and a site assessment for HPTN 052 (Thailand)
- Assisted in drafting and submitting an RO1 grant on a randomized trial looking at financial incentives and technologies for HAART adherence in North Carolina

Public Health Director, *Honduran Health Alliance, School of Medicine at UNCCH* (September 2006-May 2008)

- Led a focus group with community organizers and health promoters on future community health needs
- Coded and analyzed focus group data and reported on major themes
- Authored master's paper on program sustainability

Interviewer/Analyst, *Action-Oriented Community Diagnosis Team*, *Department of Health Behavior and Health Education, UNCCH* (October 2006-May 2007)

- Completed a comprehensive community assessment using community-based participatory research methods with homeless individuals in Alamance County, NC
- Developed guides, conducted interviews and focus groups, and analyzed qualitative data
- Organized a community forum with team members on CBPR results

Research Assistant

- *Healthy Families Durham, The Center for Child and Family Health at Duke University, Durham* (September 2005-December 2006)
    - Recruited and randomized first-time mothers into an evaluation study of a home visiting program
    - Administered standardized assessments to participants in their homes (in English and Spanish)
- *Washington University Science Outreach /M.A. Henry Consulting in St. Louis, MO* (May-August 2005)
    - Maintained data; wrote, edited, analyzed, and created reports for four NIH-

funded projects
- *UNC-CH Cecil G. Shep's Center at UNC Chapel Hill* (May-September 2004)
    - Collected quantitative data in rural Central and Eastern NC on chronic disease, spirituality, and death (in English and Spanish)

PROGRAM, POLICY EXPERIENCE and OTHER RELEVANT EXPERIENCE

Sexual and Reproductive Health Technical Specialist, *International Center for Research on Women* (December 2013-March 2014)
- Provided technical assistance, including conducting two workshops, on gender-transformative programming, research, and indicators for the FACT project with the Institute for Reproductive Health at Georgetown University.

Research Assistant, *Department of Population, Family and Reproductive Health* (March 2013-current)
- Working with a small group of faculty to start an Advocacy Institute, designed to bring science-based advocacy research, teaching and practice to the School of Public Health.

Hopkins-Guttmacher Policy Fellow, *Guttmacher Institute* (Summer 2011)
- Lobbied for international and domestic reproductive health issues
- Attended coalition meetings on behalf of the organization

Co-Facilitator *The CHANGE program for domestic violence offenders in Durham and Orange County*
(June 2006-July 2010)
- Facilitate groups for court-ordered men on topics such as violence; power and control; and sexual, physical, and emotional abuse

Public Health Director, *Honduran Health Alliance, School of Medicine at UNCCH*
(September 2006-May 2008)
- Led and maintained collaborative international relationships with organizational partners
- Headed the 2007 trip of medical students and physicians in rural Honduras:
    - Oversaw six days of a women's gynecological and family planning clinic
    - Directed a three-day training for medical students on conducting workshops in rural communities on women's health using adult-education principles
    - Co-led a conference in Spanish with local physicians on cervical and breast cancer in Honduras
    - Led a conference with lay health promoters on building self-efficacy for family planning counseling
    - Conducted workshops with rural women on topics including family planning, sexually transmitted infection, cervical cancer, and hypertension

TEACHING EXPERIENCE

Teaching Experience

Course title	Professor(s)	Duties
2013		
Sexually Transmitted Infections in Public Health Practice	Dr. Heather Bradley	Assisted with grading, online LiveTalks, and course organization Wrote and recorded full lecture entitled *"International HPV vaccine rollout in developing countries"*
Fundamentals in Program Evaluation (2012 and 2013)	Dr. Kristin Mmari	Assisted in grading and course management for this 130-student class. Lectured and taught on "*Impact evaluation*" (2013) Taught a mini-lecture entitled *"Coverage: determining who is using program services"* (2012)
2012		
Issues in the Reduction of Maternal and Neonatal Mortality in low-income Countries	Drs. Linda Bartlett & Luke Mullany	Assisted with grading, discussion facilitation, and course organization
Social and Economic Aspects of Fertility	Dr. Nan Astone	Assisted with grading, discussion facilitation, and course organization
Population, Health and Development	Dr. Stan Becker	Assisted with grading, lab instruction, discussion facilitation, and course organization
Population Dynamics and Public Health	Drs. Stan Becker and Henry Mosley	Assisted in grading and course management for this 250-student class Taught 20-minute labs on fertility, mortality, data sources, population growth, and economics
2008		
Intervention Methods	Dr. Allan Steckler (at UNCCH)	Helped prepare, develop, implement, and grade for this graduate-level course in the HBHE department Taught classes on leading small groups; working internationally in public health; and monitoring and evaluating international behavioral interventions

Course Instructor

"Exploring International Perspectives in Medicine and Public Health," with Honduran Health Alliance (HHA) at UNCCH (Spring 2007)

- Designed and taught this semester-long course for medical students participating in HHA

PUBLISHED MANUSCRIPTS

Published:

- Scott V., Gottschalk L., Wright K., et al. *Community Health Workers' Provision of Family Planning Services in Low- and Middle-Income Countries: A Systematic Review of Effectiveness*
- Studies in Family Planning 2015, 46 (3): 241-261 (**Hinson L** in acknowledgements)
- Boccoum Y., Kouanda S., **Hinson L.**, Ba-Nguz A. and Bingham A. *Community perceptions of malaria vaccines: qualitative research from the sanitary districts of Kaya and Hounde in Burkina Faso.* Global Health Promotion 2014, 21(1): 76-87
- Chin-Quee D, **Hinson L**, L'Engle K, Otterness C, and Janowitz B. "*Bridge over troubled waters: Considerations in transitioning emergency contraceptive users to hormonal methods"* Contraception 2012; 85: 363-368
- L'Engle KL, **Hinson L**, and Chin-Quee D. "*I love my ECPs: challenges to bridging emergency contraceptive users to more effective contraceptive methods in Ghana."* Journal of Family Planning and Reproductive Health Care 2011; 37:146-151

In preparation:

- **Hinson L,** Murithi L, Dhillon P, Steinhaus M, Chintu N, Nalubamba M, and Santillan D. *"The intersection of protection and pleasure in sexual relationships and the implication for use of family planning in Zambia"*
- Murithi L, **Hinson L** Dhillon P, Steinhaus M, and Santillan D. *"The social context of sexual relationships in Malawi: results from formative research."*

*ORAL PRESENTATIONS [*presenting author(s)]*

- **Hinson L***, Murithi L, Dhillon P, Chintu N, Nalubamba M and Diana Santillan. *The Social Context of Gender Dynamics and Sexual Relationships: Potential Impact on Woman's Condom and SILCS Diaphragm Uptake in Zambia.* To be presented at the 2015 International Conference on Family Planning in Bali, Indonesia, November 9th-12th.
- Scott, V*.; Gottschalk, L.; Wright, K.; Twose, C.; Bohren, M.; Schmitt, M.; Lantos, H.; Li, M.; **Hinson, L.**; Ray, A.; & Ortayli, N. *Community Health Workers' Provision of Family Planning Services: A Systematic Review on Effectiveness.* Presented at the International Conference on Family Planning in Addis Ababa, November 13th 2013.
- **Hinson L***. *"Predictors of early mortality among a cohort of American men: National Survey of Adolescent Youth (NSAM)"* Research day at JHSPH Department of Population, Family and Reproductive Health. May 11th, 2012 in Baltimore, MD.
- L'Engle KL*, **Hinson L**, Lanham M, and Chin-Quee D. *"Male Partner's Roles in Women's Use of Emergency Contraception."* Panel session at the International Conference on Family Planning: Research and Practices. November 15-18, 2009 in Kampala, Uganda.

- **Hinson L*** and Chin-Quee D*. *"Men's role in their partner's use of emergency contraception: data from Ghana."* Oral presentation at the International Consortium for Emergency Contraception in New York City, September 2009.
- **Hinson L*** and Chatterjee A*. "*Ethical dilemmas in international medicine: cases from the Honduran Health Alliance.*" Oral presentation at the Unite for Sight 5th Annual Conference, April 2008. Yale University.

POSTER PRESENTATIONS

- **Hinson L*,** Dayton R, Mmari K, and Hindin M. *Mode effect and couple concordance in the reporting of current family planning method in Southern Honduras.* Population Association of America, April 11, 2013 in New Orleans, LA.
- **Hinson L*,** Astone N., Marcell A, Dariotis J., Pleck J., Emerson M, and Sonenstein F. *Timing and predictors of early mortality among a cohort of American men from the National Survey of Adolescent Males.* Population Association of America, April 12, 2013 in New Orleans, LA.
- **Hinson L*,** Dayton R, Guest G, and Mmari K. *Contraceptive communication and decision-making in Choluteca Department, Honduras: A qualitative study with couples*. American Public Health Association Annual Meeting and Exposition in Washington DC. October 31st, 2011.
- **Hinson L**, Corneli A, Parker L, Kim M, Cox C, Kazembe P, and Gamble T*. *The process of HIV status disclosure to HIV-positive children: Experiences from Lilongwe, Malawi*. Presentation at the XVIII International AIDS Conference in Vienna, Austria. July 18-23, 2010.
- Corneli A, **Hinson L**, Parker L, Kim M, Cox C, Kazembe P, Wong, C*. *Parents'/Caregivers' and Minors' Perceptions of Informed Assent in HIV-Related Research in Lilongwe, Malawi. P*resentation at the XVIII International AIDS Conference in Vienna, Austria. July 18-23, 2010.
- Parker L, **Hinson L**, Corneli A, Kim M, Cox C, Kazembe P, Abler L*. *The role of HIV prevention media campaigns and school programs on the disclosure of HIV status to HIV-positive children ages 8-17 in Lilongwe, Malawi.* Presentation at the XVIII International AIDS Conference in Vienna, Austria. July 18-23, 2010.

REPORTS and THESES

- Cortez, R, **Hinson, L** and Petroni, S, (2014), *"Adolescent Sexual and Reproductive Health in Dhaka's Slums, Bangladesh."* No 91291, Health, Nutrition and Population (HNP) Knowledge Briefs, World Bank.
- **Hinson L** and Spzir M. "*Meeting summary: hormonal contraception and the risk for HIV acquisition*." An internal FHI360 document based on a one-day expert review of the scientific evidence (2009)
- **Hinson L** and Wilcher R. "*Opportunities for faith-based organizations to integrate family planning with HIV/AIDS services*" An FHI and Christian Connections for International Health policy brief (2009)
- **Hinson L**. "*Planning for Sustainability: The Honduran Health Alliance*" Master's thesis (2008)

EDITORIAL EXPERIENCE

Co-editor, International Journal of Gynecology and Obstetrics special supplement in Family Planning (2012-2013)

- Coordinated submission and review process of manuscripts from the 2011 International Conference on Family Planning in Senegal
- Co-wrote the editorial

Peer-reviewer

- International Journal of Obstetrics and Gynecology Supplement on Family Planning from the 2013 and 2011 International Conferences of Family Planning
- Abstracts for the 2013 International Conferences of Family Planning
- Journal of Family Planning and Reproductive Health Care

AWARDS, GRANTS, and OTHER RECOGNITION

- 2012 and 2013 recipient of the Fellowship in Family Planning in the Department of Population, Family and Reproductive Heath
- 2011 recipient of the Hopkins-Guttmacher Fellowship, Department of Population, Family and Reproductive Heath
- 2010-2012 pre-doctoral traineeship with the National Institute of Allergy and Infectious Disease (T32-A1050056-12)
- 2010 Global Research Services/FHI360 funds to conduct qualitative primary data collection with couples around family planning communication in Choluteca Department, Honduras
- 2008 Ethel Jean Jackson Award for Exemplary Public Health Education and Practice
- 2008 Graduate Student Opportunities Fund to conduct focus groups in El Corpus, Choluteca with community leaders and lay health advisors
- 2008 Health Behavior and Health Education travel funds to present at the Unite for Sight 5th Annual Conference at Yale University

PROFESSIONAL AFFILIATIONS

- Population Association of America (2012-current); International Consortium for Emergency Contraception (2009); Triangle Area Populations Society (2008-2009); American Public Health Association (2006-2008; 2011-2012); Global Health Council (2006-2008)
- Toastmaster's International (2009-2010)

LEADERSHIP EXPERIENCE

- Public Health co-Director of *Bienestar*, a tri-school organization dedicated to serving the health needs of Baltimore's Spanish-speaking population (2011-2012)
- Co-President of the *Departmental Student Alliance*, an organization servicing student-faculty relationships within the department of Population, Family and Reproductive Health (2011-2012)
- Pioneered FHI's *Global Health Research Fellowship* by creating the structure and objectives (2008-2010)

- Co-founder of *FHI360's Mentoring Program,* which involved garnering support and funds to pilot and evaluate the program (2008-2009)
- Public Health Director of the *Honduran Health Alliance* (2006-2008)

RELEVANT SKILLS

- **Training:** Duluth Model: Creating a process of change for men who batter (2010), Research Ethics (2013), Good Clinical Practices (2010)
- **Computer:** Stata, NVivo, Atlas.ti
- **Language**: Advanced in spoken Spanish, proficient in written Spanish, basic French comprehension